

AIRFIX magazine

AUGUST 1970

FOR PLASTIC MODELLERS

2s 6d

MONTHLY



**IN
THIS
ISSUE**

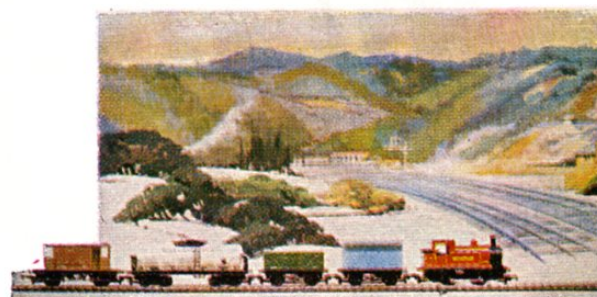
Modelling and motorising HMS 'Discovery'
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**backgrounds
for waterline enthusiasts!**



'war game' landscapes

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Bottom left: World War I tank Bottom centre: Lee/Grant tank Top left: 88mm Gun Right: Centurion



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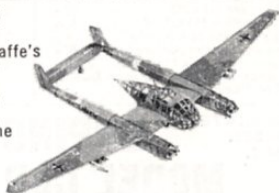
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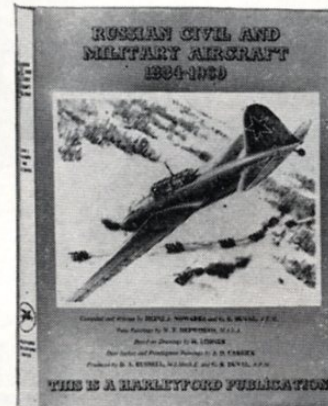
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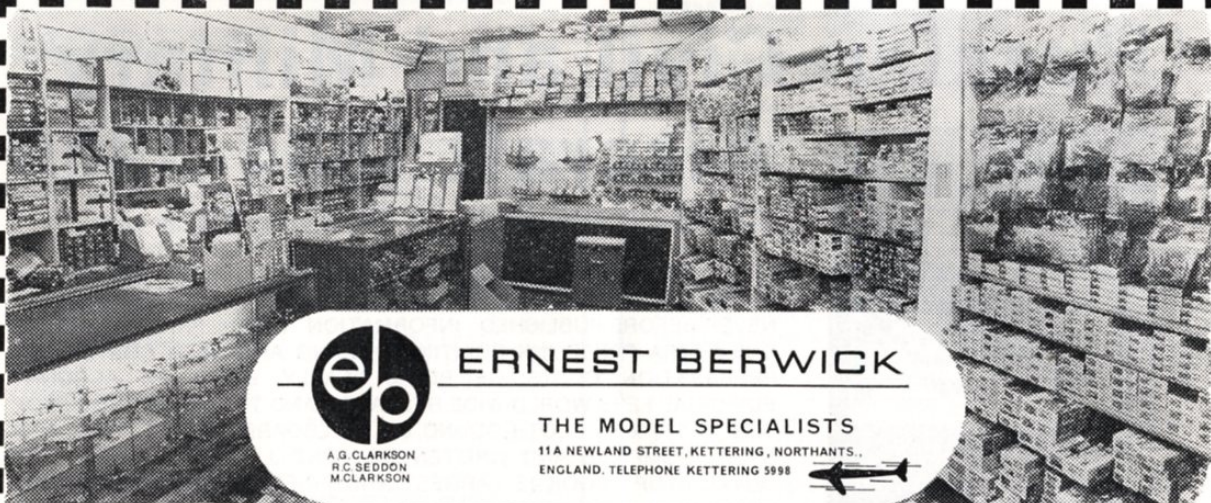
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AIRFIX magazine

AIRFIX magazine FOR PLASTIC MODELLERS

August 1970

Volume 11 No 12

Editor Chris Ellis

Cover Picture

Chipmunk WK521 of 'The Skylarks' aerobatic team resplendent in its current markings of light aircraft grey with strip dayglo areas. This picture supplements last month's Chipmunk articles and would make an excellent reference for anyone contemplating an alternative finish to that provided in the Airfix kit. Sheet dayglo is provided in the ABT range of transfers (available from BMW Models) and the cheat line and Skylarks markings can easily be painted and cut out from coloured transfer strip. Keith Palmer finished his Chipmunk model in exactly these markings to prove how easy it was, and managed to win an area heat of the IPMS National Championships in the process. See page 521, last issue, for precise positioning of the markings.

(Photo by Keith Palmer)

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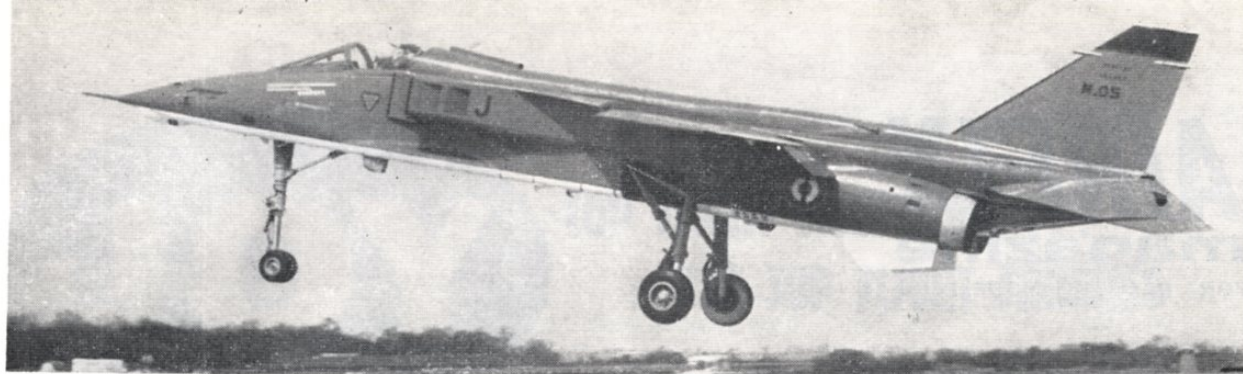
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The marine version of the SEPECAT Jaguar during one of the many catapult take-offs from the simulated carrier deck at RAE Bedford (Mintech photo).



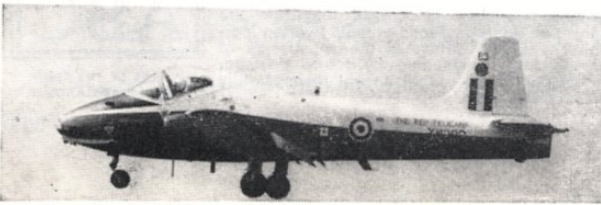
THE SEPECAT Jaguar M05, naval version of the Anglo-French strike/trainer aircraft, has recently completed its deck catapult and arrestor gear trials at RAE Bedford. Two visits were made to the unique facilities at Naval Air Department which has a carrier deck laid out beside one of the main runways on the airfield. Trials teams from both French and British experimental establishments together with representatives from BAC, Preston and Rolls-Royce were also present. The maritime version of Jaguar has been ordered for the French Aeronavale and having successfully completed the initial parts of its acceptance programme will now carry out further work at sea on board the French carrier *Clemenceau*.

This version of the versatile Jaguar has several differences from the single-seat strike aircraft. Most noticeable is the entirely different undercarriage which has single main wheels in contrast to the twin-wheels on the landplane. The nosewheel also differs and there are two strakes under the rear fuselage and the inevitable arrestor hook. The aircraft used at Bedford was painted extra dark sea grey on all upper surfaces and white under the wings, tail unit and fuselage. A large letter 'J' in black appeared on the jet intakes and the code 'M05' appeared on the fin.

New Aircraft for the Pelicans

The popular Central Flying School aerobatic team 'The Red Pelicans' have started the 1970 air show season with their new Jet Provost T5 aircraft. With at least one show a week either at home or on the Continent, they are now well used to their new mounts. I saw them first at the 'Barnstormers' show at Black-

Jet provost T5 XW290:83 of the Red Pelicans team landing at Blackbushe during the 'Barnstormers' show on Whit Monday.



bushe on Whit Monday and can report that the display is equally impressive as those given in previous years.

The colour scheme adopted is standard Training Command, red, white and grey. The words 'The Red Pelicans' appear on the rear fuselage in line with the tailplane and the CFS pelican badge is displayed in red on a black circle on the fin. The aircraft's code numbers are shown immediately above this. Two aircraft in the team noted were XW290:83 and XW295:88. Apart from the minor dust storm kicked up by the JPs on the Blackbushe runway during take-off and landing, other notable features were the size of the new canopies on these aircraft which seemed to dwarf the pilots in comparison to the previous marks; the absence of tip tanks which used to be a main recognition feature and the strakes that are fitted low on the nose of the aircraft. To convert a JP4 model into a 5 looks at first glance to be a fairly formidable task and one which I will have to think a lot about before reaching for my balsa wood, plastic card and modelling tools!

The USAF Shows

The first two USAF Open House shows in the UK were held at the beginning of the season at Bentwaters and Lakenheath. Both produced some interesting aircraft and, in the case of the latter, fine weather in the early part of June added considerably to the pleasure of the day.

At both venues an unusual visitor was an aircraft from the in-flight refuelling unit at Rhein-Main airport, Germany, in the shape of a KC-97J. All of these units come from the US Air National Guard and rotate through Rhein-Main regularly. The Tennessee Air Guard did the honours at Bentwaters and Lakenheath though in the former, the aircraft 0-30230, kept well clear of my camera until its part in the flying display. On the other hand, 0-30352 presented itself in Lakenheath's static park in an ideal photographic position providing one arrived early enough to miss the crowds. Both of the aircraft were in spotless condition, showing no real signs of their obvious age.

For many, the most interesting part of the Lakenheath display was the demonstration of the Fulton rescue system. Readers will recall that last month I mentioned the fact that the 67th ARRS at Woodbridge, in common with most other USAF air rescue squadrons, had given up using this method and nowadays worked closely with the HH-3 helicopters for rescue missions. I was therefore gratefully surprised to find that the programme included a demonstration of this unusual recovery method given by the only unit still operating in this mode—the 57th ARRS from Lajes, Azores. Two balloons were flown with the pick-up wire suspended from a line between them. The HC-130 (14866) caught the wire first go and then flew round the airfield reeling in the dummy victim. This was, if I recall correctly, one of the first public demonstrations of the Fulton method in the UK and for my part I would much prefer to be rescued by a helicopter than fly through the air at great speed on the end of an overgrown fishing line. The method looked very complicated from my vantage point and although it enables rescues to be made without a fixed wing aircraft having to land, there are fairly obvious disadvantages.

Also revealed for the first time to public gaze was an RAF Buccaneer from No 12 Squadron. The aircraft, XV349, displayed

AIRFIX magazine

the fox head insignia of the 'shiny twelfth' on the fuselage just aft of the jet intake. The attentions of the Lakenheath crowd may have been the cause of its difficulty in 'lighting the torch' after the main display was over, but a little ground crew magic soon effected a repair and the aircraft taxied out for its short hop to neighbouring Honnington.

First Day Covers

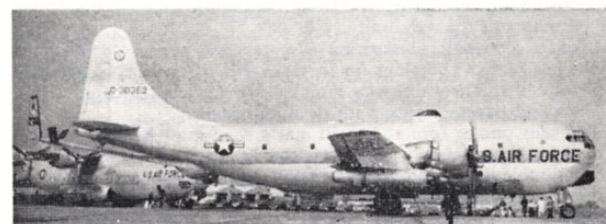
Something new for the Navy occurred on June 12 when the HMS *Ark Royal* air group embarked on the carrier for the first time. First day covers, so beloved by stamp collectors, were issued to commemorate her last commission. For the event, post offices at Yeovil, Lossiemouth, Haverfordwest and Helston used a special 'one-day-only' handstamp on all of the specially posted letters. Each cover carried an individual design for each squadron embarked, together with the squadron crest.

Flying Flea Returns

The Midland Aircraft Preservation Society based in Coventry exhibited side-by-side two examples of the Henri Mignet Pou-du-Ciel at the Coventry Air Pageant on May 31.

These two examples, one owned by the society and the other by member Gordon Riley, are in the process of being rebuilt to static exhibition standard. The first aircraft, G-AEOH, was constructed in the 'thirties in Sutton Coldfield by Mr R. C. Streather who flew the machine locally during 1937 but was eventually restrained from doing so by his wife. The Flea was eventually dismantled and the remains were bought by Mr R. E. Ogden, past chairman of the British Aircraft Preservation Council, who constructed a new fuselage. Space precluded him going on with the scheme as he later bought a Moth Minor and BAC Drone for preservation and the machine came into the possession of Gordon Riley in March this year. A Scott Squirrel engine was obtained from the Northern Aircraft Preservation Society and has been rebuilt by another Coventry member.

The second machine, G-AEGV, was built by the East Midlands Aero Club and flown by them at Sywell during 1936-37. The original engine was passed on to a BAC Drone and the fuselage became an instructional airframe with a local ATC squadron during the war. The remains were donated to MAPS in January 1968 and a new fuselage and metal parts have been constructed in the Society's Coventry workshop.



Top: KC-97J of the Tennessee Air National Guard in the Lakenheath Open House static park. The aircraft was in immaculate condition. Above: Flying Fleas G-AEGV and G-AEOH, now preserved by the Midland Aircraft Preservation Society, on display at the Coventry Air Pageant on May 31. Right: Convair C-131 Samaritan 0-25787 taxies out for take-off after the flying display at Lakenheath.

August, 1970

NEW BOOKS

REVIEWED FOR MODELLERS

Ship Books

US WARSHIPS OF WORLD WAR 1, by Paul Silverstone. Price 50s.

ITALIAN WARSHIPS OF WORLD WAR 1, by Aldo Fraccaroli. Price 45s.

Both published by Ian Allan Ltd, Terminal House, Shepperton, Middx.

THESE two books are exactly uniform with previous titles in the series which will be well-known to warship enthusiasts. That said, these need little more commendation from us for they commend themselves by reputation. Pictures, text, and presentation are all first-class with details of individual classes tabulated in the style of previous volumes. The whole series makes an indispensable reference aid for warship enthusiasts and the new titles should on no account be missed by anyone who counts himself in this category. Modellers, in addition, will find dozens of possible conversion ideas for 'four stacker' destroyers in the volume on US warships, for a full 'as built' listing of American destroyers of World War 1 vintage is just one of the invaluable items in these excellent books. Even at slightly higher prices than previous volumes (due to recent price rises in paper and printing) these books are still top value for money.

Weapons . . .

NAVAL SWORDS, by P. G. W. Annis. Price 30s.

BLUNDERBUSSES, by D. R. Baxter. Price 30s.

Both published by Arms & Armour Press 677 Finchley Road, Childs Hill, London NW2.

TWO more books in the Arms and Armour 'Illustrated Monographs' series, these give a detailed and easy-to-read coverage of their respective subjects with pictures on almost all the 80 pages of each volume. For anyone interested in weapons, either as a collector or just as a non-collecting enthusiast, these are ideal reference books with good introductory text and detailed descriptions and illustrations of individual weapons. We found the book on blunderbusses the more interesting, perhaps because it is a more colourful subject, but the sword book (which covers both British and American swords) is most fascinating for it reveals an amazing number of subtle detail changes and variations even in the 'standard' types of officers' swords.

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ANTIQUE FIREARMS and EDGED WEAPONS, both by F. Wilkinson. Published by Guinness Superlatives Ltd, 24 Upper Brook Street, London W1. Price 84s each volume.

BOTH these big books (each of more than 250 pages) consist of a series of monographs (called 'signatures' by the publishers) which give a remarkably detailed history of the respective subjects, presented in an extremely lavish and luxurious way. They are printed on art paper throughout with illustrations on every page and at least one full page colour plate to each monograph. This has resulted in two of the most handsome and informative books we've seen for many a year. Though neither sets out to be definitive, they each contain a very thorough

Continued on page 592





HMS Discovery

Story of a famous ship, now

a popular Airfix model

BY LAWRENCE PHILLIPS

In the sheltered waters of King's Reach on the River Thames in the very heart of London lies one of the most famous of British ships. The former Royal Research Ship *Discovery*, heroine of Captain Robert Falcon Scott's first expedition to the Antarctic, today flies the White Ensign as HMS *Discovery*, Flagship of the Admiral Commanding Reserves.

The *Discovery*, moored alongside the Victoria Embankment in company with the old Great War sloops HMS *President* and HMS *Chrysanthemum*, provide the floating headquarters of the London Division of the Royal Naval Reserve. But she is also a place of pilgrimage for thousands of foreign visitors who flock to the capital city every year and offers the rest of us an echo of the heroic era of our maritime past which has been largely lost in the frantic rush of our modern society.

The name *Discovery* had long been associated with polar exploration when the present ship was launched at Dundee in 1901. The late Sir Clements Markham, President of the Royal Geographical Society, claimed at the time that *Discovery* was the sixth exploration ship to bear the name. Four of these were noteworthy.

The newly-formed English East India Company fitted-out the 'good and lucky ship called the *Discovery*' in 1602. Under the command of Captain George Weymouth she sailed 100 leagues up the newly-discovered Hudson Strait when his frightened ship's company required the captain to turn back. The celebrated Henry Hudson set out on his fourth and last voyage in the same *Discovery* in April 1610. Described as a 'flyboat of 70 tons burden' the vessel entered the strait and bay which now bear his name on yet another attempt to find the North West Passage.

The crew mutinied and Hudson, with certain of his principal officers, was set adrift in a boat. The gallant leader died but the mutineers, who returned to England in the *Discovery*, escaped punishment.

The Admiralty bought a small collier in 1776 and fitted her out as HMS *Discovery*. The craft sailed with the *Resolution* of Captain James Cook on his third and last voyage of exploration to the Pacific.

Captain George Vancouver sailed round the World in the last decade of the 18th Century in yet another HMS *Discovery* which was also a converted collier.

The Royal Navy's expedition towards the North Pole in 1875-76 under Captain Sir George Nares in HMS *Alert* included a whaling ship specially built to withstand the rigours of the ice which had been purchased by the Admiralty and re-named *Discovery*. This HMS *Discovery*, we are told, was a great success navigating in ice and consequently was made the prototype of Captain Scott's *Discovery*.

The Antarctic Continent, surmised by Cook, proved by Ross, but first penetrated by Scott, is a land one-and-a-half times the area of continental Europe covered by an immense smooth ice-cap, with a few mountains, and sloping down to the sea which it meets with cliffs of ice, broken by glaciers.

Captain James Cook, on his second voyage of circumnavigation, 1772-75, navigated in high southern latitudes, crossing the Antarctic Circle three times. He reasoned forcefully that there was an Antarctic Continent covering the South Pole although his ship, the *Resolution* had been turned back by ice whenever he had tried to approach near enough to sight it.

For half a century after Cook's voyage European attention turned to the North Pole. During this time a handful of private persons, mainly traders and whalers, mostly British or American, ventured occasionally south. The Weddell Sea was discovered in 1826 and Sir James Ross, who had reached the North Magnetic Pole in 1829, continued Cook's work in the south and achieved all that was possible in sailing ships.

The International Geographical Congress at Berlin in the last year of the 19th Century revived European interest in the Antarctic. The National Antarctic Expedition of 1901 was sponsored by the British Government, the Royal Society and the Royal Geographical Society. It was decided to explore the southern continent taking advantage of steam navigation and sledging parties—expertise gained in northern expeditions.

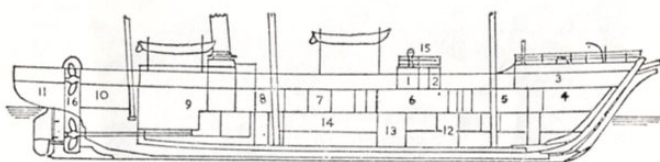
Sir Clements Markham, President of the Royal Geographical Society, was regarded as the father of the Expedition and worked hard to raise the £100,000 to finance it. The Admiralty agreed to second officers and men who volunteered and a brilliant young officer, Commander Robert Falcon Scott, was appointed to command in June 1900.

There was no satisfactory ship available and it was decided to build one at a cost of £45,000. The *Discovery* was built at Dundee by the Dundee Shipbuilder's Company Ltd, Steven's Yard, under the supervision of her designer, Mr W. E. Smith, one of the Chief Constructors at the Admiralty.

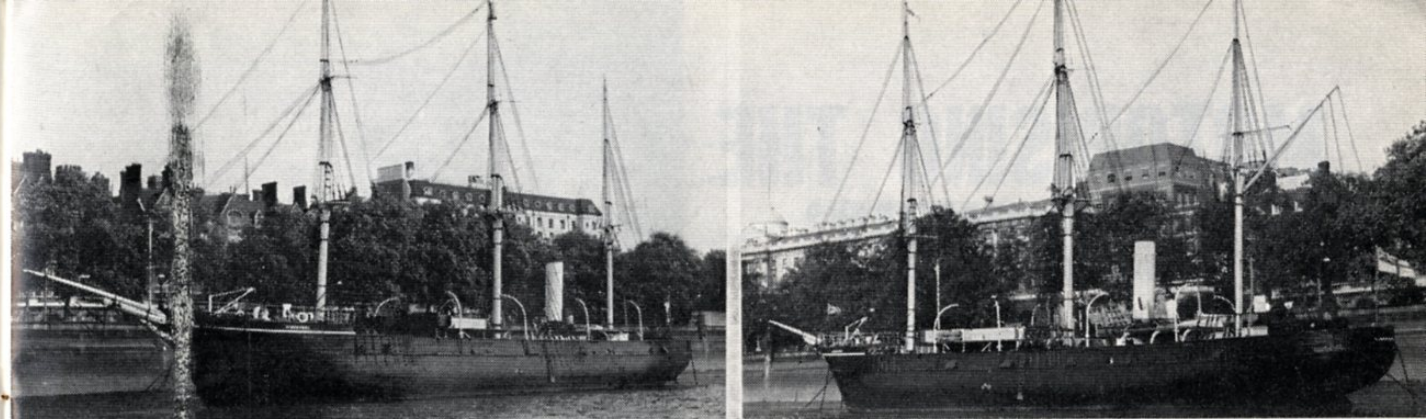
Like the old whalers before her *Discovery* was purpose-built down to the last plank. The plans for the 1875 *Discovery* were lengthened ten feet and the new ship was built of oak and elm, with powerful engines and barque-rigged with double topsails.

The sails on the fore and main masts were interchangeable. The accommodation below was fitted-up for life in the polar regions by fitting double doors and skylights and lagging under the decks. Her frame of solid English oak, 26 inches thick, was made to resist tremendous side stresses. Her bows were strengthened to a degree beyond anything known in wooden ship construction. Some of her bolts were eight feet long, running entirely through wood. *Discovery* was, in short, considered a masterpiece of specialised shipbuilding.

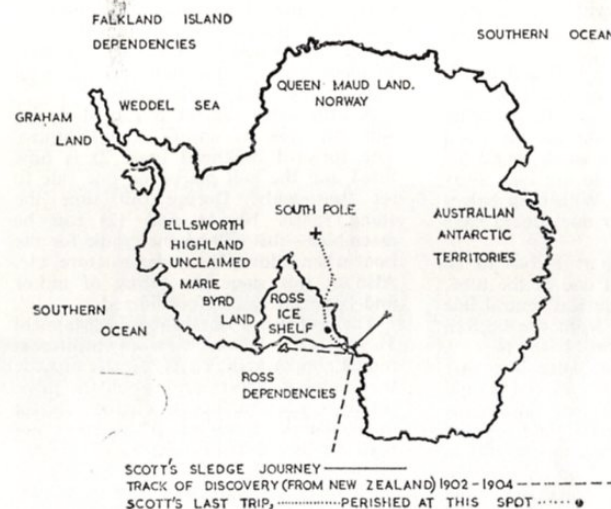
The ship's powerful, raking stem was designed to ride up over and crush the ice, and the stern, with its pronounced overhanging,



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Above and opposite page: Views of HMS *Discovery* as she now appears, moored on the Victoria Embankment as the flagship of the Admiral Commanding Reserves. She is now part of the London RNR HQ. Yards are struck, it will be noted (MoD photos). Below: Map of Capt Scott's expeditions to the South Pole.



rounded form was designed to protect the rudder, sternposts and screw when working in the ice. A spare rudder was carried and, in fact, was needed. The rudder could be shipped and unshipped at sea from the deck. The two-bladed propeller could be disconnected and raised into a well in the hull when endangered by the ice. No bilge keels were fitted because these might have been dangerous if the ship was beset by ice.

The ship was given high topsides and large freeing scuttles in the bulwarks. Laboratories for the scientists were fitted as in HMS *Challenger*, a famous research ship which had sailed round the world in the 1870s. A magnetic observatory was placed on board and the globular space round it of 30 feet radius was kept free from iron. Two years' provisions could be carried. The boats were five whalers (26 feet long) and two Norwegian prams.

The *Discovery* was launched by Lady Markham on March 21, 1901, when, with a pair of gold scissors, she cut the white ribbon holding back a bottle of Australian wine, allowing it to swing against the steel sheathing of the stem. A luncheon followed at which there were 22 speeches. A model of the ship made by the builders is displayed in the Royal Geographical Society, the ship's registered owners for the Antarctic voyage. The ship measures 172 feet on the waterline, extreme beam 34 feet, with a mean draught of 16 feet, and a displacement of 1,620 tons. The main machinery and boilers were supplied by Messrs. Gourlay Brothers of Dundee. The engines were triple expansion of 450 hp.

Early in June 1901 the *Discovery* was towed to London and berthed in the East India Dock. Manned almost entirely by Volunteer Naval Officers, and ratings, in the old tradition of British polar exploration, she sailed from the London Docks on the last day of July 1901. There were 38 crew and five scientists. Two of the ship's officers were merchant seamen, who had been commissioned into

the Royal Naval Reserve (Armitage and Shackleton). By August 1, 1901, the *Discovery* was at Spithead being 'swung' for compass correction. The King, who had assented to a request from Sir Clements Markham that she should be allowed to fly the White Ensign, visited the ship at Spithead with the Queen on August 5. The next day the *Discovery* sailed south.

The *Discovery* proved to be slow under sail, being under-canvassed, and she rolled heavily having no bilge keels. The peculiar stern kept the helmsman dry but proved very buoyant and made her steer badly in a heavy sea. Running before a heavy gale she once ran 223 miles in 24 hours. But her good qualities soon endeared her to her company and she proved very stiff and seaworthy. A small leak proved troublesome because the ship's double skin made it impossible to locate, until the ship was docked in New Zealand.

The Expedition left New Zealand in December, the ship heavily laden and crossing the stormiest ocean in the world. They passed safely through the pack ice into open water beyond, and after landing at Cape Adair, Scott coasted along Victoria Land and reached McMurdo Sound on January 21, 1902, which he chose as the ship's winter quarters.

But first he had to survey 500 miles of the Great Ice Barrier. Sailing further than Ross, Scott discovered a new land which he named after King Edward VII. Then he returned to winter quarters.

Although Scott had benefited by the advice of McClintock and Nansen, he found all their equipment untried and difficult to master. Only the navigator, Louis Bernacchi, had had previous experience of polar work. Nevertheless, the morale was high and scientific work carried-on steadily.

In November 1903 Scott made a sledging journey south accompanied by Dr Edward Wilson and Ernest Shackleton. On December 30 they had reached latitude 82 degrees 16 minutes and arrival back on the ship on February 3, having covered 950 miles in 93 days. But the dogs had failed badly and so had the men, and scurvy had so affected Shackleton that he returned home in a relief ship.

The *Discovery* could not get free from the ice during the summer. So a second winter was passed in McMurdo Sound. Scott, with two seamen, Edgar Evans and Lashly, made a sledge journey to the westward. Again, it was doubtful if the *Discovery* would be freed. In January 1904, two relief ships arrived, the *Morning Glory* and the *Terra Nova*, with orders that the *Discovery* was to be abandoned if not freed in time. The Admiralty had memories of the unfortunate Franklin. The first half of February 1904 was spent in blasting a way through the ice.

After other tribulations *Discovery* arrived back in Britain in September 1904. The expedition had accomplished valuable scientific work despite the lack of experience of Captain Scott and his men. Scott after writing his able and popular account of the expedition, again took up his career in the Royal Navy, but planned to return to make an attempt to reach the South Pole.

In 1912 Scott led his second Antarctic Expedition in the *Terra Nova*

Continued on page 587

'Discovery' modelling article on next page

MOTORISING THE 'DISCOVERY'

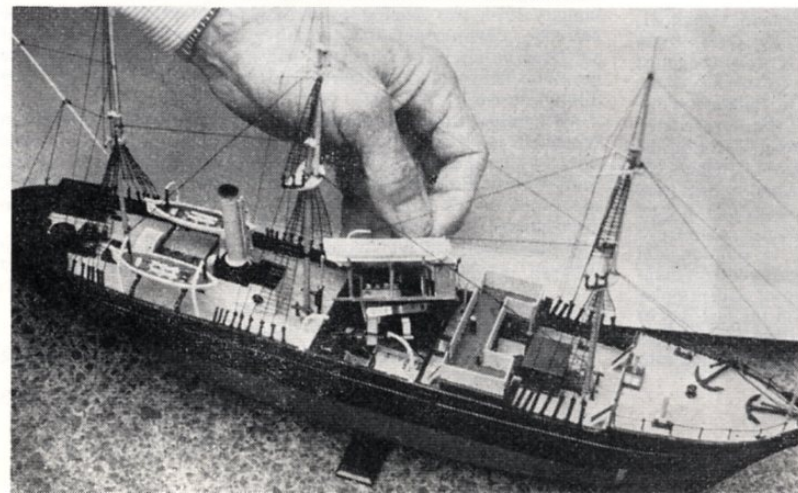
Bert Lamkin adds a motor and details to the Airfix model

THE Airfix kit of the *Discovery* can be made into a floating version fairly easily and the following is one method of achieving this. In this case, though, I used batteries rather than wind to provide the motion, although adding sails later need not be too difficult. However, as *Discovery* was a 'sail and screw' ship, motor power is quite legitimate. Incidentally, the Airfix model differs in several respects from the ship as she is at present, moored in the Thames near Waterloo Bridge, so if you want to be accurate to the existing ship, you'll need to take a trip to see her, armed with notebook and pencil.

Back to the kit; the first job is the propeller assembly, this means removing the forward spigot from part 7 (the blades of the prop slope slightly backwards) and drilling it to take a piece of 1/16 inch silver steel rod. Mount this on a block of wood using the rear spigot in a suitable hole to hold the propeller steady and, with a 3/64 inch drill, make a hole which is central. The drill will virtually remove the rear spigot in the process. If you are scared of this, you can no doubt buy a suitable ship screw from your local model shop.

The shaft is a four inch length of 1/16 inch rod; two flats are filed at one end and with the aid of plastic cement the propeller is pushed on to the rod. It must be a tight fit but do not use a hammer.

Below: The entire midship deck section and its fitting is made to lift off to give access to the motor and batteries which can be seen in place in the hull. **Top of page:** Finger on the wire switch which turns the motor on and off—it is disguised as a steam pipe with a piece of scrap plastic.



The stern tube is a 2 1/2 inch length of 3/32 inch brass tube with a 1/16 inch bore. Check that the prop shaft rotates freely in this.

The next job is on the hull and this is to open out the two recesses that normally would hold the front propeller spigot. These have to take the increased size of the stern tube. A small round file is the tool for this and do not take away more than is necessary. With both halves of the hull held together one should have a true circular hole.

The rear bulkhead (part 1) has to be drilled to take the front end of the tube. Do this by scribing a vertical central line and drilling 7/16 inch from the bottom edge. Now cement part 1 to part 9, making sure that the top edge is square—the centre line you have scribed should register with the stern join. Smear the prop shaft with grease or Vaseline and slip it into the tube. Then mount this in the hole in the bulkhead and the recess in the hull. A spot of cement will hold it in position; the end of the tube should be level with the edge of the hull.

While this is setting, the rudder (part 8) needs some filing. The post where it enters the hull is more oval than round and so will not turn freely unless it is worked on.

Now we can begin to assemble the hull. This is possibly the trickiest operation of the lot. Run cement along all the faces

of part 9 that will be in contact with part 3, not forgetting the bulkhead already in position. I find the Humbrol liquid cement best for this. Put the rudder in place and clip the hull together with bulldog clips and elastic bands.

A little extra cement is run along inside the join to ensure watertightness. The forward bulkhead (part 2) is now fitted and the hull placed on one side to set thoroughly. During this time the stand (parts 10, 11 and 12) can be assembled—this will be the cradle for the boat when adding the superstructure, etc. Also at this stage the fitting of motor and batteries can be considered.

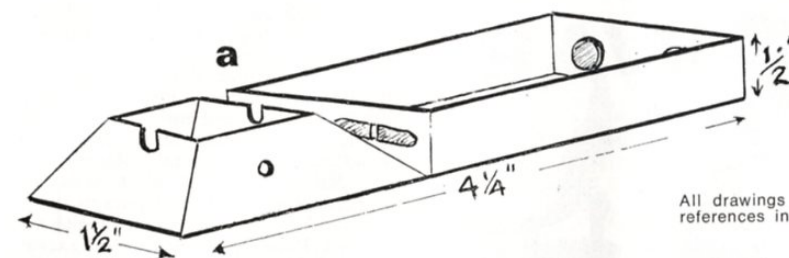
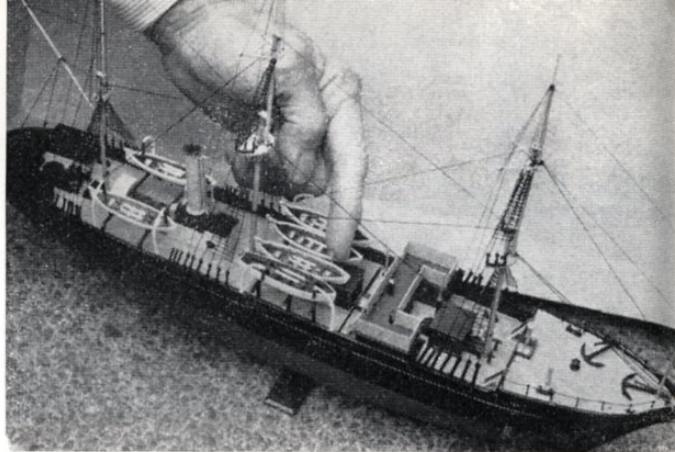
The motor is a small Japanese Mabuchi 3 volt unit (available from most big model shops) and two HP7 cells provide the power. These are mounted in a plastic card unit, constructed as shown in sketch A. Small paper fasteners are used for the electrical contacts. These are fitted into slots in the vertical walls of the battery compartment. The front pair have light springs under their 'heads'. An elastic band retains the motor within its cradle. By having the power unit separate it is easier to install in the boat and this is done after ensuring the motor runs freely and the batteries are secure and making good contact.

Returning to the hull, check in a bowl of water that it doesn't leak and then add a spot or two of UHU glue where the stern tube enters to give some extra support. Next, the rather large hole where the rudder enters has to be tackled. This calls for the rudder post to be boxed in. Strips of plastic card form the box which is tall enough to reach the underside of the deck; sketch B illustrates the point. Make sure the joint is sound by a water test.

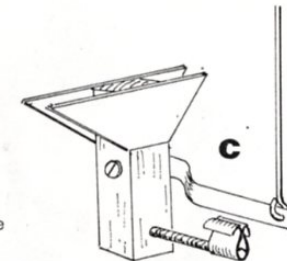
Now the motor unit can be installed. The motor I used had the armature shaft projecting about 1/8 inch, so the unit was approximately amidships. Polythene tube or cycle valve tube is used to join the two shafts and a short test is made by holding the leads from motor and battery together (a switch is installed later) so that the motor drives the propeller.

With the 'works' satisfactory, we can turn to ballasting. There is a faint water-line moulded on the hull. I emphasised this with paint and then added pieces of lead to trim the boat level to this line

AIRFIX magazine



All drawings are keyed to references in text; not to scale



allowing about 4 1/2 ounces for the rest of the kit. With this achieved the lead can be fixed with UHU and the boat put back in the water again while it sets. This will ensure you maintain an even keel.

Next in line of construction is the deck. This needs a section cut out to give access to the 'engine room'. Two cuts are made, the rear one just in front of the hole locating part 99 and the front cut 1/4 inch short of the locations of the bridge ladders (parts 77 and 78). The cuts are right across the deck. The area within

an inch wide cemented under the cut edge of the deck, support the detachable centre section.

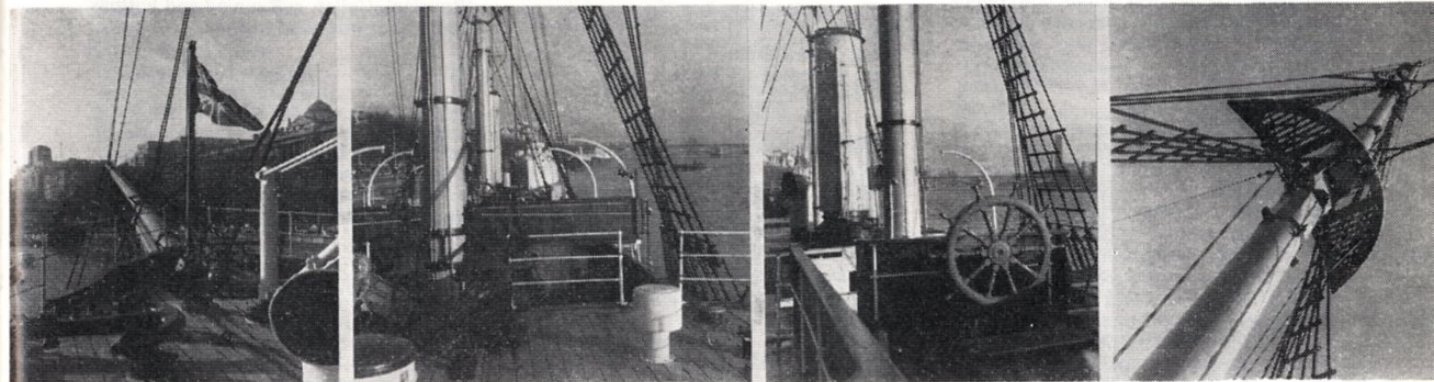
At this stage, with everything set, the hull should be painted, starting with the deck then inside the bulwarks and turning over, the whole of the hull. The kit instructions show the hull being all black.

During the time the hull is drying, the superstructure can be assembled and painted as per the kit instructions, except where access is needed below deck. These are, firstly, parts 38 to 42 assembled and cemented to the deck, but parts 24 to 37

quickly noted feature is the wheel, this is now on the bridge and not the twin unit in the stern as in the Airfix version.

I have added wind dodgers to the bridge from thin plastic card and the guard rail on the foredeck is from ordinary pins and cotton. This was done for speed but a proper standard type of ship's rail would look better—I can see this being altered later.

The yards and running rigging are omitted (as in the real ship at present) as this particular model *Discovery* is running under 'steam' at present, at an



Above: Detail views of ship show the foredeck; bridge and deck; the midship steering position; and maintop (MoD photos).

the location of the funnel assembly is also removed. This allows the prop shaft to be lubricated, so the funnel unit is a firm fit on its location but not cemented.

The rear and forward parts of the deck can now be fitted, again using the Humbrol liquid cement and any small crack between deck and sides is filled by careful application of the brush. Use rubber bands round the hull while the deck sets. Strips of plastic card about a quarter of

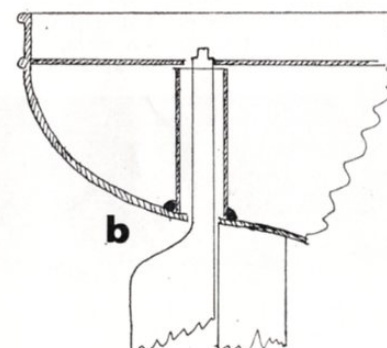
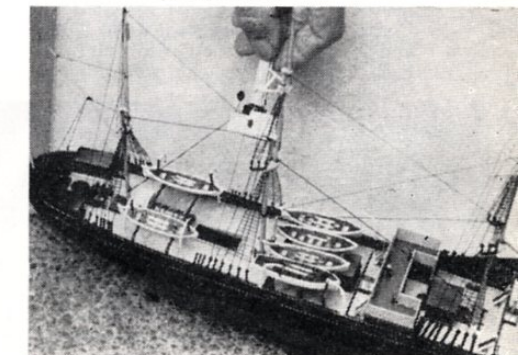
are assembled as a unit to sit on its location and be lifted when the prop shaft needs lubricating. The other departure from standard concerns the centre section of the deck. It will need reducing in width so strips of approximately 1/8 inch are cut from each side and cemented into their normal place on the hull.

Next, a small switch is made as in sketch C and mounted on the underside of the centre section. The wire operating this replaces part 98. Make sure to pass the wire through the hole in the deck before cementing the switch into position, and allow this to properly set. The boat supports (or booms) (parts 113, 114 and 115) have to be modified to cement on to the centre section instead of the bulwarks. This is done by cutting off the vertical portions and re-cementing some 1/4 inch inboard, the idea being that all the items positioned on the centre section lift with it.

As the result of a quick visit to the actual ship, I have left off some parts and added others—it would seem over the years that several modifications have taken place on the prototype—one

impressive rate of knots. As with all kits, the finished model depends on what one puts into it; the Airfix *Discovery* will produce a very satisfying little ship if one takes time and trouble.

Below: Removing the funnel to give access to the shaft for lubrication and maintenance. Pictures show the changes (mentioned in the text) needed to make the model resemble the ship at the present time.



August, 1970

SEVEN WEEK WAR



by ROBERT C. GIBSON

Part 4: The Cavalry

THE cavalry of the Seven Weeks War period is best described by type.

Cuirassiers and Heavy Cavalry

Prussia had ten regiments, including the French-titled 'Garde du Corps' (Life Guard), which probably did not go on campaign. Tunic was white and piping and facings were in regimental colour as follows:

Title	Facings/buttons
Garde du Corps	red/silver buttons/white 'litzén'
Guard Cuirassiers	cornflower blue/silver/white 'litzén'
1st Regiment	black/brass
2nd Regiment	carmine/white metal
3rd Regiment	sky blue/white metal
4th Regiment	orange/white metal
5th Regiment	light red/brass
6th Regiment	dark blue/brass
7th Regiment	yellow/white metal
8th Regiment	green/brass

'Booted overalls' were grey with red piping, lined with black leather. Breastplates were polished steel for Line Regiments, as were helmets, both with brass fittings. Breastplates and helmets for the two Guard Regiments were yellow metal, and helmets with a white Guard star in place of the eagle. The 6th (Line) Regiment wore brass helmets (with eagles); sergeants of this regiment wore yellow-metal breastplates, unlike the rest of the men.

Gloves and belts were white kid, and pouches and horse 'leathers' were black. Horse furniture was in regimental colours, edged white.

Hannover had two cuirassier regiments, both Guard Regiments, dressed in Prussian style. The white tunics had regimental colour distinctions: the Garde du Corps had red distinctions, white 'litzén' and silver buttons; the Guard Cuirassiers had cornflower-blue with yellow 'litzén'

and brass buttons. Breastplates were brass with a silver 'sun' for the Garde du Corps, black with a brass 'sun' for the Guard Cuirassiers. Horse furniture was black leather and a black, red-edged sheepskin saddle cover. A white rolled cape was carried forward across the saddle, and a pistol was carried in a holster at the right hip, strapped to the sheepskin.

The Austrian cuirassier helmet was black, trimmed with brass. The shoulder belt was white, the pouch black.

Dragoons

With one exception, all German dragoons followed the Prussian pattern, which consisted of sky-blue tunic, grey booted overalls piped red, and white webbing. Prussian regiments were distinguished by the colour of their collar tabs and shoulder straps, and their buttons:

Title	Facings/buttons
1st Guard Regt	red/brass buttons/yellow 'litzén'
2nd Guard Regt	red/silver buttons/white 'litzén'
1st Regiment	red/brass buttons
2nd Regiment	black/brass buttons
3rd Regiment	rose red/silver buttons
4th Regiment	primrose yellow/silver buttons
5th Regiment	red/silver buttons
6th Regiment	black/silver buttons
7th Regiment	rose red/brass buttons
8th Regiment	yellow/brass buttons
9th Regiment	white/brass buttons
10th Regiment	white/silver buttons
11th Regiment	carmine/brass buttons
12th Regiment	carmine/silver buttons

Headwear was the infantry helmet, with the same distinctions for Guard and Line Regiments. Horse furniture was dark blue, edged in the regimental colour, with the monogram 'FR' in the rear corner for Line, and the Guard Star for

Guard Regiments. Only the sword was carried. Cuffs were piped in the regimental colours, tunics in red.

Baden had three dragoon regiments, all with silver buttons, 'Prussian' helmets with brass fittings and emblem (a griffin). Collar, cuffs, shoulder straps and tunic piping was in regimental colours: 1st, red; 2nd, yellow; 3rd, black with red piping on tunic front and pockets.

Hannover's two dragoon regiments followed Prussian styles exactly, except for the 'White Horse' on the helmet, and the coloured cuffs:

Regiment	Facings/buttons
Cambridge Dragoons	carmine/silver buttons/white 'litzén'
Crown Prince's Dragoons	white/brass buttons/yellow 'litzén'

Hesse-Darmstadt had two Chevauleger (Light Horse) regiments, which in 1866 rated as dragoons. Tunic was dark green instead of blue, and the helmet and cuffs were the Hessian infantry pattern, but in all other respects, the uniform was 'Prussian'. Collar, cuff piping and buttons were regimental distinctions:

Regiment	Facings/buttons
1st Regiment	red/silver buttons/single white 'litzén'
2nd Regiment	white/silver buttons

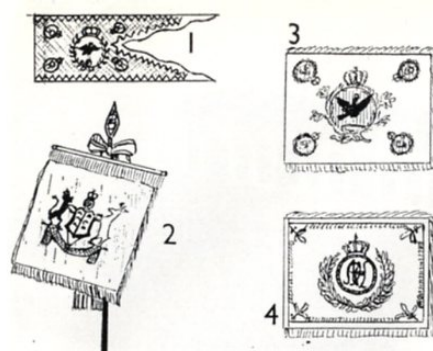
Horse furniture was green, edged in the rear corner.

Mecklenburg and Oldenburg had one regiment apiece, dressed in strict Prussian uniform with infantry kepis in sky-blue.

Regiment	Uniform details
Oldenburg Regt	Black collar, cuff and tunic piping. White shoulder straps. Kepi piped white, black band. Silver buttons. Officers had black 'Hussar' braid on tunic.
Mecklenburg Regt	Red collar, cuffs, shoulder straps and tunic piping. Brass buttons, yellow 'litzén'. Kepi band red.

The Mecklenburgers had black sheepskin horse furniture, edged red, and carried carbines as well as sabres. Oldenburg Regiment horse furniture was dark blue edged black and piped white inside.

The Hansa towns—Bremen, Hamburg and Lübeck—contributed a Cavalry Contingent, equipped and rated as Dragoons. A dark green tunic in Dragoon style was worn, with red 'facings' and piping, and white 'litzén'. The Prussian cuirassier helmet, in polished steel with brass shield and fittings was worn, but all other details were in Prussian dragoon



Above: Examples of cavalry standards. (1) 3rd Hussars (Prussia); violet ground, red border, gold wreaths. (2) 1st Württemberg Cavalry; red ground, white/red ribbon, gold fringes and ribbon trim. (3) 1st Cuirassiers (Prussia); white satin ground, gold fringe and trim, red wreath centres, black ribbons edged white. (4) 2nd Cuirassiers (Bavaria); white satin ground, silver-blue fringe and trim, gold monogram and circle, blue-white ribbons. style. Horse furniture was dark green, edged red.

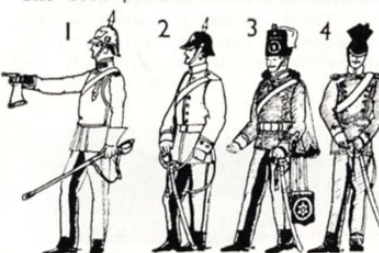
Austrian dragoons were distinguished from cuirassiers only by the double- instead of single-breasted tunic, and taller helmet crest, but since they took no part in the Bohemian campaign, they are only of academic interest.

Bavarian Chevaulegers, in the same sense as the Hessians, rated as Dragoons. Topped by the black-crested infantry helmet, their uniform was dark green shell jacket and breeches, tucked into long-boots as the Cuirassiers. Only collar and buttons (two rows vertically from shoulder to waist) identified the regiments: 1st, 2nd: carmine; 3rd and 6th: rose-red; 4th and 5th: scarlet. Even-numbered regiments had silver buttons, and odd numbers had brass. Horse furniture was dark green, edged in regimental colours with a white crown in the rear corner. White epaulettes were worn.

Reiter (Cavalry) Regiments

Saxony organised her three regiments of cavalry into 'Reiter-Regimenten', dressed in similar style to Austrian Cuirassiers, but with sky-blue tunics, and without the white 'overall' piping. The tunic was piped white, front and bottom, and collar and cuffs were in regimental colours: 1st, red; 2nd, light blue; 3rd, orange; Guard Regiment, white. Horse furniture was sky-blue, edged in regimental colours. Buttons brass.

Württemberg's four 'Reiter-Regimenten' wore a similar uniform to the infantry, with grey overalls striped broadly in red. The 1864 pattern tunic was dark blue,



PRUSSIAN CAVALRY: (1) Cuirassier. (2) Dragoon. (3) Hussar. (4) Uhlán.

August, 1970

with red piping on front and bottom, and on cuffs and shoulder 'wings'. Regiments were identified by collar patches: 1st, sky-blue; 2nd, yellow; 3rd, red; 4th, white. The 'kepi' was red with a blue band, and brass shield emblem. Horse furniture was dark blue, edged in regimental colour.

For Saxony and Württemberg, webbing was white with brass fittings.

Hussars

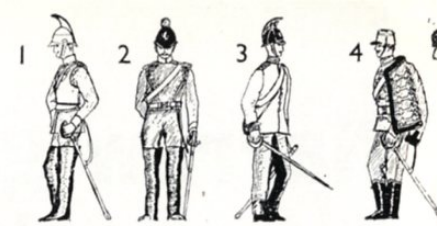
The Hussar uniform was the nearest to a standard pattern of all: nearly every state wore the same uniform with differences of colour and national emblems. Prussian Hussars formed the model for all but one of the other States: the grey, red piped booted overall were worn, the colour of the hussar tunic (called the 'attila') buttons and braid varied from regiment to regiment:

Regiment	Tunic/braid/buttons
Guard Regt	dark blue/yellow braid/brass buttons
1st (Leib) Regt	black/white braid/silver buttons
2nd (Leib) Regt	black/white braid/silver buttons
3rd Regiment	dark blue/white braid/silver buttons
4th Regiment	dark brown/yellow braid/brass buttons
5th Regiment	dark blue/yellow braid/brass buttons
6th Regiment	dark green/yellow braid/brass buttons
7th Regiment	blue/black/yellow braid/brass buttons
8th Regiment	dark blue/white braid/silver buttons
9th Regiment	cornflower blue/yellow braid/brass buttons
10th Regiment	dark green/yellow braid/brass buttons
11th Regiment	dark green/white braid/silver buttons
12th Regiment	cornflower blue/white braid/silver buttons

Further identification was aided by the colours of collar and cuffs: red for Guard, 1st, 3rd, 6th, 7th and 11th Regiments; cornflower blue for 9th and 12th; sky-blue for 8th and 10th; dark blue for the 5th; black for the 2nd and yellow for the 4th. The Guard Regiment alone wore the fur-trimmed 'pelisse' usually associated with Hussars, ie, the loose jacket worn over the left shoulder. All regiments wore the fur busby with a scroll and the Royal cypher in button colour, or the Guard star in a ring (Guard Regiment). The loose 'bag' was red. Horse furniture was a black sheepskin with a serrated edge in cuff colour. One trooper in sixteen was armed with a breech-loading carbine: the pouch and sabretache were black, with the busby emblem in button colour: slings were white.

Hannoverian Hussars were identical in appearance, except for the substitution of the crowned 'White Horse'. Guard Hussars had yellow braid and brass buttons; Queen's Hussars had white braid and silver buttons. Both wore dark blue attilas and pelisses; the busby 'bag' was red for the Guard, carmine for the Queen's.

Weimar had a tiny Hussar troop, dressed in the uniforms of the Prussian



(1) BAVARIA: Cuirassier. (2) BAVARIA: Chevauleger. (3) AUSTRIA: Cuirassier. (4) AUSTRIA: Hussar (both head-dresses shown).

2nd Hussars, differing only in state cockade and emblem.

Hesse-Cassel possessed two Hussar regiments, dressed as Prussians, the 1st in sky-blue, and 2nd in dark blue attila and pelisse. Braid was white, buttons silver; busby 'bag' was red. The sabretache was red, with a white crowned 'FJR', and edging. Slings for rifle, pouch and sabretache were white.

Austrian Hussars wore breeches and attila/pelisse of one colour: dark blue for the 1st, 3rd, 5th, 8th, 9th and 11th Regiments; light blue for the 2nd, 4th, 6th, 7th, 10th and 12th. Breeches were tucked into boots, the tops of which were braided, as were the attila and pelisse, and breeches: yellow for 1st, 2nd, 3rd, 6th, 8th, 10th and white for 4th, 5th, 7th, 9th, 11th and 12th. Buttons were brass for yellow braid, silver for white braid. Belts and slings were white, with brass fittings: sabretache red with a yellow 'FJR' monogram, edged in yellow, white and black.

Headgear is something of a problem: the Austrian Hussars in 1866 were in process of changing uniforms. Most regiments still wore a form of infantry shako, scarlet for the 4th, 5th, 6th and 8th, white for the 2nd, 3rd, 9th and 11th, and grass-green for the 1st, 7th, 10th and 12th. Piping was in the regimental braiding colour. Some regiments, for example, the 5th, wore the new-style busby, with a 'bag' in the shako colour. Horse furniture was as the Cuirassiers: a rolled white blanket was carried forward of the saddle.

Uhlan

Only three states possessed Uhlan regiments in 1866: Prussia, Bavaria and Austria.

Prussia's twelve regiments wore dark blue 'Ulankas', the peculiar double-breasted lancer tunic, piped in red for Regiments 1 to 8, and 1st and 2nd Guard Regiments, white for the 9th, carmine for the 10th, yellow for the 11th, sky-blue for the 12th. The colour of the epaulette cloth, and the buttons varied:

Regiment	Epaulette/buttons
1st Guard Regt	white/silver/white 'litzén'
2nd Guard Regt	red/brass/yellow 'litzén'
1st Regiment	white/brass
2nd Regiment	red/brass
3rd Regiment	yellow/brass
4th Regiment	sky blue/brass
5th Regiment	white/silver
6th Regiment	red/silver
7th Regiment	yellow/silver
8th Regiment	sky blue/silver
9th Regiment	white/brass
10th Regiment	carmine/brass
11th Regiment	yellow/brass
12th Regiment	sky blue/brass

Booted overalls of the usual Prussian

Continued on page 569



Cavalry figures converted from Airfix US Cavalry and French Waterloo Cavalry. Left to Right: Prussian Uhlán, Austrian Cuirassier, Austrian Hussar, Prussian Hussar, Prussian Dragoon, Guard Cuirassier, Prussian Uhlán, and Bavarian Cuirassier.

AIRFIX magazine

Narrow gauge coach

SIMPLE CONVERSION FROM A RATIO KIT

WHEN I assembled the first of the newly-introduced Ratio GWR four-wheeled coaches it became obvious very quickly that there was a lot of scope in the kit for the conversion enthusiast. Ratio themselves have realised this and they are catering for the enthusiast in a most praiseworthy way by selling the individual mouldings that go to make up the kit as separate items. For example, if one wished to make use of the underframe for a conversion job then it is possible to buy a complete set of parts for the underframe without having to purchase the body. When one considers the comparatively high price of the Ratio kits necessitated by their limited production run this commendable feature can result in a great saving and an extension of the kit's possibilities.

This month's conversion uses a pair of body sides from the all-third kit No 5610 which are available at a price of 7s 5d per pair complete with glazing strips. By comparison the price of the complete all-third kit is 21s 8d, so there is an obvious saving purchasing the items separately if only the sides are required. The body sides looked to me as if they could be readily cut down and used to form the basis of a free-lance narrow gauge coach and this proved to be the case. The Ratio GWR all-third body sides measure 4½ inches long and have five compartments.

The body length is about one inch longer than the Playcraft/Jouef bogie coach so it would seemingly be possible to combine the chassis of the Playcraft bogie coach (P.40) with the Ratio all-third coach body to make an interesting compartment bogie coach. Against this, however, the Playcraft vehicle costs round about 16s and this seems an expensive method of supplying a chassis. Next I considered using a pair of small Playcraft tip wagons (Reference P.20) and modifying them to make a pair of bogies with which to construct my own chassis. This seems to be perfectly possible and would be reasonably cheap as the tip wagons are very inexpensive. Yet another alternative would be to use the bogies from the Bogie Log Wagon (P.21) or the Eggar Bogie Flat Wagon (P.26).

But before I could try any of these possibilities my local model railway retailer produced a number of second-hand Eggar Bahn rolling stock items including a P.25 drop side wagon and the

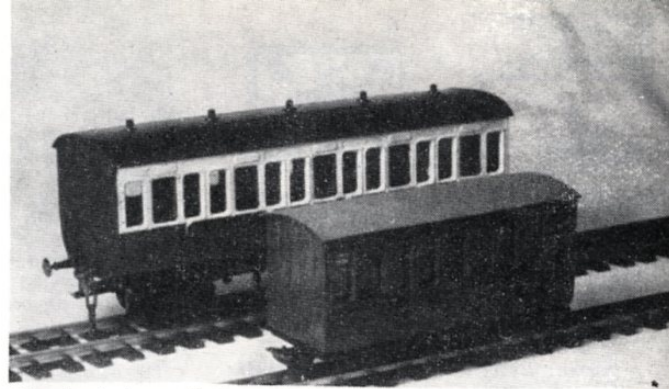


BY **NORMAN SIMMONS**

thought came to mind about making a four-wheeled coach. A quick check of the dimensions showed that the drop side wagon had an overall length matching that of three of the all-third compartments so the decision was made to make a three-compartment all-third four-wheeled narrow gauge coach. Incidentally, the second-hand four-wheeled drop side wagon cost me 4s.

Construction was simplicity itself. First the drop side wagon body had to be prized away from the chassis. Eggar Bahn rolling stock is predominantly plastic and I have found from experience that the various mouldings are only lightly cemented together. This proved to be the case with my wagon, and a craft knife blade inserted between body and chassis was all that was required to wedge the two parts apart. I haven't worked out yet what to do with the surplus drop side wagon body, but for someone who is really keen it would be perfectly possible to modify this conversion so that bodies could be switched; a drop side wagon one minute and a passenger coach the next. However, I decided to make a permanent job so we will proceed on that assumption.

The chassis was modified slightly by removing the tiny brackets that project along the sides of the chassis side member to support the body. Also the lower member of the channel section frame was

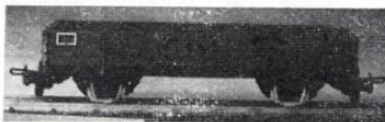


The simple but realistic coach in the foreground is a cut-down version of the standard gauge Ratio GWR coach kit shown behind it.

removed. This enabled the chassis side members to be deepened later on during construction, a feature which is not essential but which I feel helps to give a characteristic low chassis British look to the model which matches the typically British outline shape of the body. I hope I have made this point clear but I have always been struck by the fact that the bodies of British narrow gauge rolling stock always look very much lower and nearer to the rails than their Continental equivalents.

Next, the body sides were reduced in length to three compartments. I simply removed two compartments from one end of each side. This reduces the overall length of each body side to a shade over 66 mm long. A small notch was cut out in the back at the lower bottom corners to enable the sides to clear the ends of the chassis buffer beams. The backs were cleaned up to remove all moulding marks and ridges to enable the glazing, which was fitted later, to fit flush against the sides. Two notches were cut in the ridge at the back of each side which fits against the top of the chassis to enable compartment partitions to be installed. The height of each side was reduced by approximately 1 mm, which in practice has the effect of reducing the depth of the top moulding strip without actually removing it. Finally, the sides were immersed in hot water and squeezed with the fingers to reduce as much as possible the tumble home curvature of the sides. This is not essential but straight sides do appear to be a characteristic of British narrow gauge passenger rolling stock.

The compartment partitions were cut from 40 thou plastic card and four pieces were needed, each 22 x 22 mm; two forming the ends and the other two for the partitions between the three compartments. The body was assembled by first cementing one side on to the chassis, next the four partitions and finally the



The Eggar wagon which forms the basis for the coach chassis.

AIRFIX magazine

second side. This was done as quickly as possible so that the parts could be adjusted before the cement set, and the whole body made perfectly square. Anything not quite right at this stage will distort the chassis which is, after all, only a strip of relatively thin plastic. It is a good idea to stand the model on a sheet of glass whilst the cement is drying and to apply a light force such as an elastic band, which will ensure all four wheels touch the ground and remain that way when the cement has set. Leave the parts to dry thoroughly before cleaning up the joins with craft knife and file.

The body sides should be painted inside and out at this stage. The amount of detail you wish to incorporate is up to you but I expect most people will want to fit seats. If these are painted a contrasting colour they will show up quite clearly against the compartment partitions, which could be painted brown to represent varnished woodwork. When the paint is dry the glazing can be cut and glued into place. It is probably a good idea to fit the glazing before the seats, which can be used to wedge the glazing in place.

A false roof cut from the same 22 mm wide strip of 40 thou plastic card which I use for the compartment partitions was cemented in place. The finished roof can either be made of plastic card or can be adapted for the Ratio roof; however, the Ratio roof costs 5s 7d and would mean that the finished model would become a trifle expensive. It has a number of advantages, particularly the fact that it is curved to the right shape and use can be made of the roof ventilators and rain strips which are already moulded in

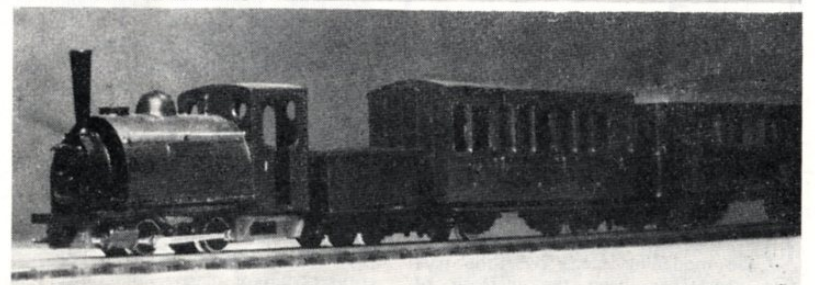
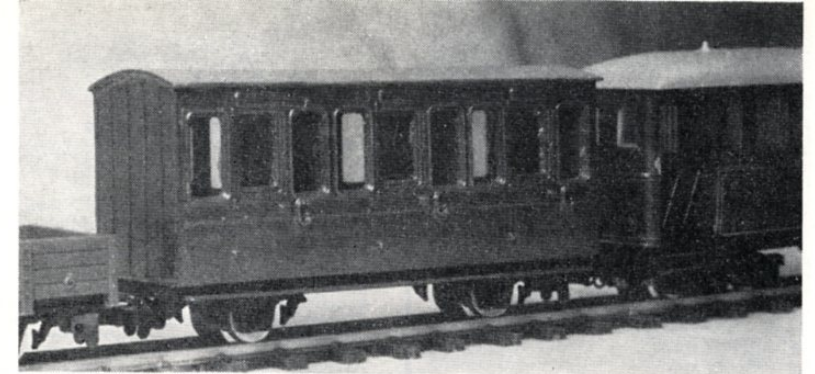
cavalry pattern were worn. The 'tshapka', or lance-cap, was taller than in 1914, and covered in a black waterproof cover. Prussian lancers carried both sword and lance, and one in sixteen a carbine. The lance-flag was white over black for troopers, and a black eagle on a white ground for NCOs. Warrant officers and officers carried swords only.

Bavarian Uhlans were dressed as the Chevauleger Regiments, except for the Prussian style lance-caps: collars, as well as cuff piping, were carmine-red. The 1st Regiment had brass, the 2nd silver buttons. Lance-flags were white over light blue. Belt and slings were white.

Austrian Uhlans wore dark green 'Ullankas' with red collar, cuffs and plastron. Dark green booted overalls with a red seam stripe were worn, and a gold/red striped waistbelt. Carbine slings were white, and carbines were carried. The lance-cap was similar to the Prussian, but no cover was worn, since the colour of the top was that of the regiment:

Top colour	Regiment
Imperial Yellow	1st, 6th
Dark Green	2nd, 7th
Scarlet	3rd, 8th
White	4th, 9th

August, 1970



Top: A close view of this extremely simple but effective model. Above: The same coach seen in a narrow gauge passenger train; the locomotive is the model made from an Airfix 'Pug' tank engine and described in our June 1969 issue.

place. But plastic card glued over a balsa wood former can be nearly as good and very much cheaper. The ends should be faced with 20 thou card which can be panelled with strips of 10 thou card according to taste.

Lastly, the chassis side members can be deepened by cementing a strip of 20 thou card 2 mm wide along the outside of the Eggar chassis. Be careful not to foul the pivoted axle guards and make

sure they can swing without hindrance. Such details as foot boards and vacuum pipes can be added.

The finished model matches up well with existing Playcraft and Eggar passenger rolling stock. It does, however, have a typically British air about it and as such is likely to appeal to British narrow gauge enthusiasts who, let's face it, haven't much to choose from on the market today, at least not in 4 mm scale.

Seven Week War—from page 567

Top colour	Regiment
Light Blue	5th, 10th
Carmine	11th and 12th

Buttons were brass for Regiments 1 to 5 and 12, silver for 6 to 11. Lance-flags were yellow over black. Horse furniture was red, edged yellow.

Landwehr

Prussian Landwehr cavalry wore the 'Landwehr cross' instead of the usual emblem: the Hussars wore a tall felt cap in place of the bushy, cylindrical in shape, sloping towards the top.

All other Reserves wore the national 'regular' uniform for Guard Cuirassiers. Trousers were grey, piped red, and lined in black leather. All other accoutrements for men and horse were as the Prussians.

Hesse-Cassel had one cuirassier regiment: the Garde du Corps. The uniform, horse fittings, and helmet were exactly as the Prussian Garde du Corps, the only difference being that the breastplate was polished steel.

Hannoverian cuirassiers wore a silver 'White Horse' in place of the Prussian Eagle; the Hessians replaced the Lion with a 'Guard Star'.

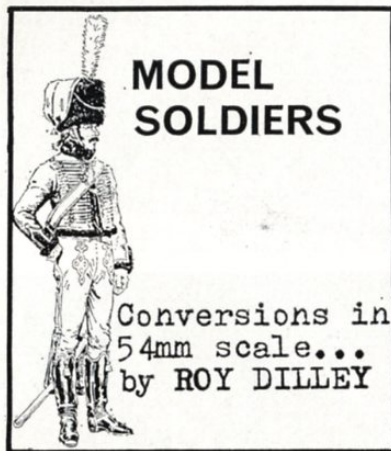
Bavaria's four Cuirassier Regiments

wore sky-blue tunic and trousers, and black 'long boots'. Piping was red, and regiments were identified as follows:

Regiment	Distinctions
Garde du Corps	red facings, yellow-metal helmet and breastplate, buttons silver
1st Regiment	red facings, polished steel helmet and breastplate, buttons silver
2nd Regiment	red facings, polished steel helmet and breastplate, buttons brass
3rd Regiment	carmine red facings, polished steel helmet and breastplate, buttons brass

Helmet fittings on 'steel' helmets were brass. Horse furniture was sky-blue, edged in red or carmine, and covered, forward of the valise (behind the saddle) with a white sheepskin, edged in red/carmine.

Austrian cuirassiers wore white tunics and sky-blue trousers (booted overalls). Cuffs, collars, shoulder straps and tunic piping were in regiment colours: for example, the Kaiser Franz Joseph Regiment had dark red, and silver buttons; the Ferdinand Regiment had grass-green and silver buttons. The overalls had black leather insides and bottoms, and white seams.



ONE of the outstanding features of the modelling scene over the past few years has been the increase of interest in tank and armour models, as the basis for collection in their own right, as auxiliary or background equipment in model soldier collections, and as fighting equipment for wargames. A great many excellent AFV kits are currently on sale, from the Airfix 1:76 scale range, to the huge 1:21 scale products of Tamiya and other Japanese companies. For the collector and converter of 54 mm (ie, 1:30—1:32 scale) model figures who wants to include AFVs in his collection there are, fortunately, kits available to 1:35, 1:32, and 1:30 scale, all of which are more or less suitable for his requirements, and which can in many cases themselves be converted to increase the range. Airfix, incidentally, are introducing some ready-made polythene 1:32 scale vehicles, including a Bedford truck, 105 mm gun, and Abbot.

Some collectors, of course, also scratch-build vehicles to cover gaps in the commercially produced lines, and a very high standard of modelling has been reached in this branch of the hobby, as can be proved by the exhibits at almost any meeting of the British Model Soldier Society, International Plastic Modellers Society, the Miniature Armoured Fighting Vehicle Collectors Association, and the various wargamers' groups and societies. One of the finest representative collections of 54 mm scale figures and 1:32 scale vehicles that I have seen is contained in the

COLOURING DETAILS
Battledress blouse: Khaki-drab.
Trousers: Khaki-drab.
Berets: Navy blue or black (RTR).
Headsets: Service green.
Duffel-coat: Fawn.
Scarves: 'Regimental' colours or bright polka dotted.
Equipment: Shades of khaki-green.
Binocular-case: Semi-matt brown.
Boots: Brown, fawn (suede), or black.
Badges: Silver or gilt according to regiment.
Goggles: Grey (rubber) with silver lenses.

North African Campaign 1941-43 Diorama, made by Lieut-Commander John Sanders, in which a great variety of effects has been achieved.

By and large, and with a few notable exceptions, such as in Monogram and some Tamiya products, the figures supplied as 'crews' in commercial AFV kits leave much to be desired from the points of view of anatomy, uniform, equipment, and in some cases scale! This month's article shows how this situation can to some extent be remedied by the conversion to 'crew' figures of other types of plastic miniatures. I have confined myself to models of British personnel 1939-45, but hope to deal in future articles with other nationalities and periods. Modellers to 1:76 scale can also follow some of the tips given here, to provide 'crews' for OO/HO size AFV models, though obviously the conversion work need not be so detailed and you'll have to use different 'source' figures.

Most soldiers, and the British are certainly no exceptions, tend, when on active service, and for reasons of comfort, convenience, utility, or even downright eccentricity, to adopt and adapt items of dress and equipment into somewhat different styles from those to be seen in the more formal atmosphere of barracks and parade ground. Laid down 'orders of dress' become very blurred at the edges, with various items creeping from one to another and becoming supplemented by non-regulation and even civilian items. This was particularly notable in the North African campaign of 1940-43. Captured enemy equipment, and weapons, particularly hand-guns are also popular additions to issue, and the converter wishing to achieve a realistic effect with his models will bear this in mind.

In World War 2, AFV crews were very given to this process of adaptation, and reference to the great number of photographs available covering the various theatres will show how the basic

uniform items were changed and added to. The introduction of the tank-suit in the latter years of the war did much to restore some semblance of uniformity, but coloured scarves, non-regulation footwear, and other bits and pieces continued to contribute to the individual soldier's ideas of suitable fighting wear.

Here then are several easy conversions to start the ball rolling, and I am sure that you will all think of other ideas along the same lines. I have made use of figures by several different manufacturers, and some of them had been lying dormant in my scrapbox for a considerable time. Where I have used a piece that so far as I know is not currently obtainable, I have tried to give an alternative that can be purchased. The vehicles that appear in the photographs are a converted M8 armoured car by Tamiya, and a Daimler 'Dingo' 1:32 scale scout car that I scratch-built myself from plastic sheet and odd parts.

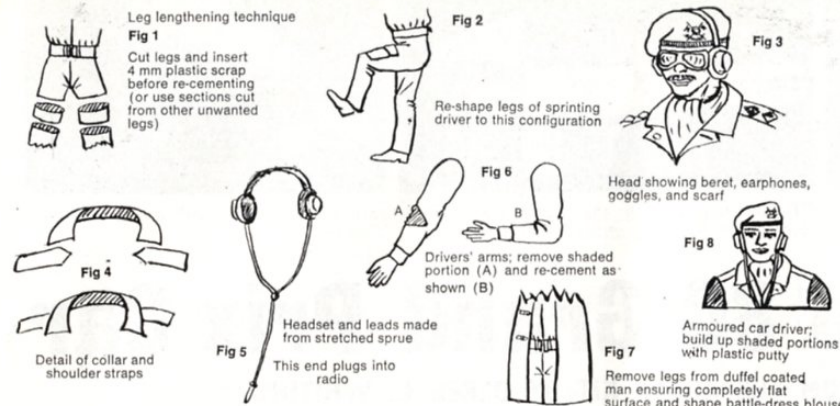
Conversion 1

This is for an officer of 12th Lancers in the scout car.

Figure required is the Airfix Motor Racing Driver sprinting.

Remove the figure from its base, and lengthen the legs. This is done by cutting them off at mid-thigh and inserting a 4 mm cylinder to each before re-cementing and smoothing down. This process was fully described in my article in *Airfix Magazine* for April 1970 (Fig 1). By cutting through at the knee and re-cementing, the right leg should now be straightened, and a similar operation will enable the left lower leg to be swung forward so that the foot is in position to rest on the front plate of the scout car (Fig 2). Obviously the legs can be altered in this way to suit whatever vehicle you want the figure to fit.

Next remove both arms and set them on one side whilst the waist is trimmed and a belt of .01 inch plastic card is fitted round and fixed with liquid cement. The helmet should now be cut down and plastic putty added to form the beret: over this cement a 1 mm strip of .01 inch plastic card to represent the strap of the wireless head-set. An Airfix 1:76 scale Churchill tank bogie wheel reduced in thickness is then fitted to each side of the head to make the earphones (Fig 3). Whilst carrying out these operations to the head, be careful not to damage the facial features



or the goggles. Now re-cement the arms to the body, bringing the right arm backwards from its original position so that the hand is level with the rear of the trunk, and fixing the left arm close against the side. This gives the effect of the man steadying himself against the motion of the vehicle by grasping the sides and rear (see photograph).

Shoulder straps and collar are cut from .01 inch plastic card and fitted to the battle-dress blouse as shown in Fig 4. Using the diagrams from previous articles, make from scrap plastic a pistol holster and ammunition pouch, and fit them to the right side of the belt. Similarly make a binocular case, and attach it to the front of the body, with a strap of 1 mm plastic card passing round the neck. Fill all cracks and gaps caused by cutting with plastic putty, and when this has hardened thoroughly, smooth down. Finally, if desired, drill small holes at the base of each earphone and fit a length of stretched sprue to represent the wireless leads (Fig 5). The figure is now ready for undercoating and painting.

Conversion 2

This is for the scout car driver but would be quite suitable as a driver for most vehicles. For the basic figure I used a seated man from the Renwall Sky-sweeper AA gun kit, but either of the seated male figures from the Airfix Grandstand kit would do.

Trim off the moulded arms from the seated figure by cutting and filing, being careful to preserve the shape of the torso. Flatten the helmet and use the

plastic putty to obtain a good beret shape. Add a belt of 2 mm wide .01 inch plastic strip round the waist which will need a little filing to ensure a good fit. Now remove both arms from the Airfix kneeling mechanic, and, using the same technique as I described in Conversion 1 for legs, cut and re-cement the arms to a bent shape suitable for a man holding a steering wheel (Fig 6). When these have been attached to the body, cut shoulder straps and fit them in place with liquid styrene adhesive. It will be noted that on the Renwall figure the blouse collar is already moulded, but on either of the Airfix pieces it will be necessary to add this item. Next add a little plastic putty to the collar opening and shape it to form a scarf. Again fill all gaps and smooth down when completely dry, then undercoat and paint.

Conversions 3, 4 and 5

These make the crew of the M8 armoured car in British service. Figures required are the duffel coated man from the Airfix Grandstand set, the mechanic from the Airfix Motor Racing set, and the body of the kneeling mechanic from the Airfix Motor Racing set.

These are extremely simple but remarkably effective figures and involve a minimum of work. To make the officer in the turret, take the duffel-coated figure and cut off the legs, smoothing off the coat bottom until it is completely flat (Fig 7). Trim the jacket which shows at the opening of the duffel coat, to the shape of a battle-dress blouse. Then smooth off the cap peak and build it up with plastic putty to make the beret. Use

Above: Dingo commander leaving his vehicle; this is the figure pictured on the opposite page. The Dingo is a 1:32 scale scratch-built model by Roy Dilley.

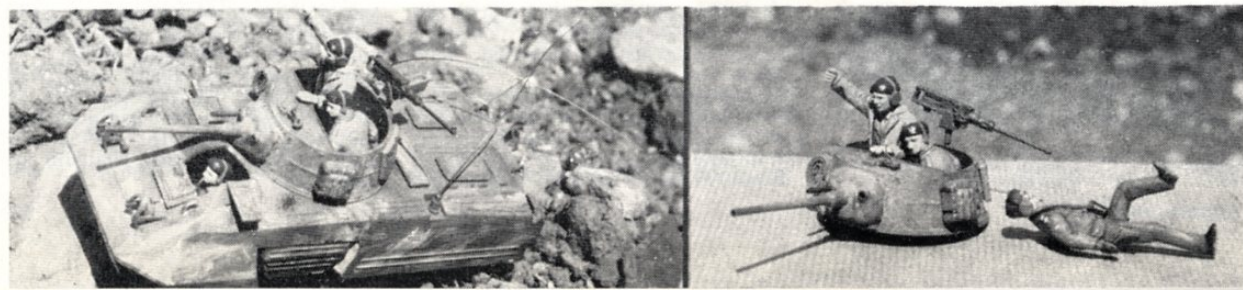
the technique from Conversion 1 to add the wireless headset and leads, if required. Now cut and re-set the left arm so that the hand rests on the turret top when the figure is fixed to the turret floor, and finally trim off the folded document from the raised right hand.

The gunner figure, also in the turret, is made from the Airfix bending mechanic, No 11 in the Motor Racing set. Both legs are removed completely from the trunk at the top of the thighs just below the buttocks, making sure that a perfectly flat surface remains on the base of the body. Cut and re-set both arms to a bent shape, and remove the head, re-cementing it in place turned to look along the line of the left shoulder. Carry out the same procedures for beret and headset as have already been described, and add a waist belt of .01 inch plastic card, 2 mm wide. The figure is now ready for painting. It should be noted that both these pieces should be painted before fixing into the turret, the floor of which should have a coat of matt black applied.

The driver consists only of the head and upper part of the body of the kneeling mechanic left over from Conversion 2. Cut off the required section as in Fig 8. Remove the head, and re-set it facing to the front, again carrying out the appropriate work for shaping the beret and adding the headset. It is necessary to build up the upper arms with a little plastic putty, and this should be allowed to dry thoroughly before final shaping. I fixed the driver, after painting, into a little open-topped box, painted matt black throughout, and attached it to the inside of the car hull. As you can see from the photographs, these simple conversions give the model a very realistic appearance, and variations on these themes can be used to equip almost any AFV model with an authentic-looking crew. Look through those old discarded figures in your scrap box, buy a packet or two of Airfix Motor Racing figures, and with a little plastic card and plastic putty, plus some imagination and experimentation, you will be able to amaze yourself with the variety of figures you can produce.

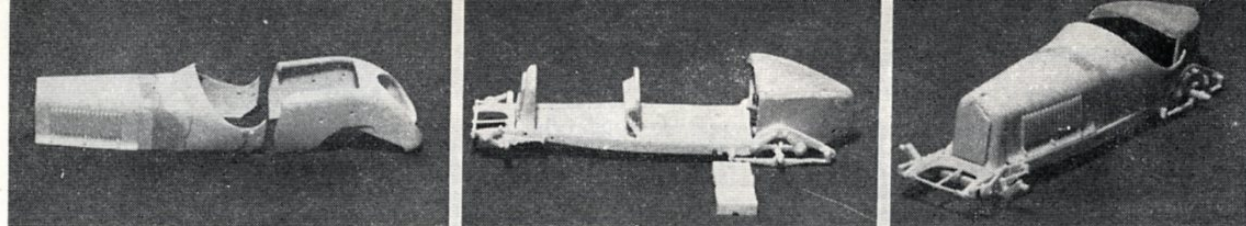
I hope to be dealing with some more advanced World War 2 figure conversions in a future article, and I will try to cover some of the other colourful, not to say bizarre, rig-outs that were worn.

Below, left: A Tamiya 1:35 scale M8 armoured car finished as a British RAC vehicle and complete with crew made up as described in the last three conversions this month. Below, right: A closer view of the turret crew and the commander of the Dingo scout car (Conversion 1). All are from Airfix Motor Racing figures.



Below: The realism possible with 54 mm figures and 1:32/1:35 scale figures is well demonstrated in this view of John Sanders' superb Desert War diorama. All the vehicles (Crusader, Scammell tractor, Dingo, and Morris 15 cwt truck) are scratch-built and the figures are mostly from the Airfix Motor Racing range converted.





Above: Three stages in carrying out the Alfa GP conversion, with the basic body modifications, the new tail and shortened chassis, and the basic assembly completed.

Alfa Romeo 8C Grand Prix Car

CONVERSION FROM THE AIRFIX KIT BY DEREK L. WHITING

THE 1932-34 'Monoposto' Alfas must be among the best known Grand Prix cars of all time. These were the cars which equipped the then brand new 'Scuderia Ferrari' and were, in fact, the ex-works team cars much modified by the Ferrari team to comply with the 750 kilogramme formula. These cars then dominated the Grand Prix scene for about three years. The only real rivals during this period were the Bugattis, but these scored few successes.

When Airfix introduced their fabulous kit of the 1933 8C sports car, I was immediately possessed with the desire to convert this into the Grand Prix monoposto. It proved to be possible but perhaps a little 'fiddly'. The consolation comes with the finished result. Whilst not for beginners, it is not over difficult, just requiring a modicum of patience.

We start with the chassis, assembling as per kit instructions parts 2, 3, 4, 5 and 9. When thoroughly set, cut an 11 mm section from the chassis, using a razor saw, at the point indicated on the drawing, and cement the two parts together. While this is drying, drill a 3/32 inch hole at each end of the exhaust pipe opening and cut a slot with a razor saw. Clean up with a file, then cement body parts 21, 22 and 23 together, and when dry cut the bonnet from the scuttle where shown on the drawing. Then cut a 4 mm wide strip of 40 thou plastic card and cut and fit four pieces to the end of the bonnet. When dry, cement to the scuttle.

Back to the chassis now. Cement the bulkhead in place (part 1), together with part 4. Next, cut a piece of 10 thou plastic to fit between the dumb-irons and cement underneath part 4, to form the front apron. Returning to the body, cut off the tail end at the point indicated on the drawing. Now, drill a hole in the centre of the dashboard (part 20) to take the steering column (part 17). Assemble the suspension. File off the differential housing from the centre of the back axle before assembly and discard the propeller shaft. Next, cut a new scuttle fairing from 10 thou plastic (part J) on drawing. Cement in place, holding it in position until the cement will hold. I used a liquid cement for this job as it dries more quickly. I also ran cement round the joint and then left it to harden. When it has set really hard, the scuttle is carefully brought down to the finished shape, using 0320 and 0400 'wet or dry' paper rolled round a pencil. The joint is now carefully blended into the body, using 0400 paper.

We can now tackle what is perhaps the most awkward part of the conversion, namely the pointed tail. This can be carved and hollowed from wood, or do as I did, using 30 thou plastic card cut to shape as shown on the drawing and bent and cemented to shape. When this 'box' has dried out, cement it to the rear of the body. Allow to dry and then, after smearing cement over the top, build up with Brummer stopping. Use two or more layers to build up the required height. Roughly file the cockpit sides to blend in with the sides of tail. Spread stopping over the sides of the tail to about half-way along. When dry, carefully file and sandpaper to finished shape. When all is smooth, smear cement over the stopping with your finger and, when dry, finally 'polish-sand' to final finish with a piece of worn 0400 paper. Cut two square openings on bottom left-hand side of the bonnet where shown, and then cut two pieces of rod to represent the superchargers. Bind these pieces of rod with thread to represent the finning. Scrape and file away the moulded bonnet straps and

sandpaper until completely removed.

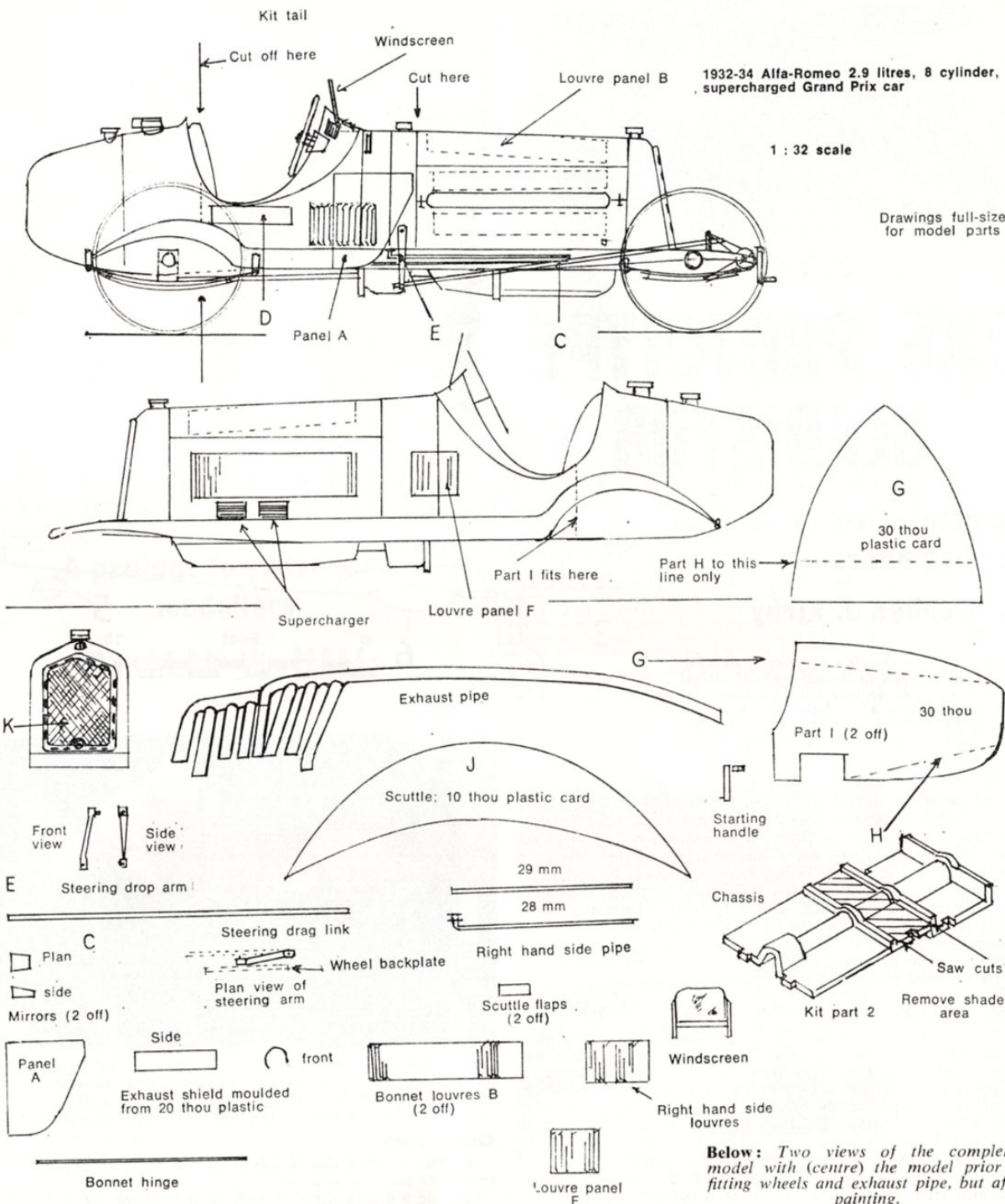
Assemble the body to the chassis. Cut and fit a piece (part A) to the right side. File the front of the radiator flat and then file the edges to a more rounded shape. Cut a piece (part K) from 40 thou plastic and cement this to the front. Now, using heat-stretched sprue of about 1½ mm diameter, bend an outline to fit round the new front. File 16 small 'flats' on the front face of this. Do not cement the radiator in place yet. Make the exhaust pipe now. This can be a simple one with the pipe just being shaped at the bonnet end, or it can be built-up with the eight pipes. Although this takes more time, it is far more satisfactory. I used plastic cocktail sticks for this job, the front part being warmed and bent to shape. The second point is also bent to form the front part of the tail pipe. The tail pipe is now cemented to this, and then carefully bent to follow the body shape. Cut the remaining six pieces and cement them in place to complete the multi-branch exhaust. Smooth all joints. Note that two pipes are longer than the others. These provide the fixing points inside the bonnet. The fixing is merely a length of plastic rod cemented across the two long pipes. Do not cement the pipe in place until the body is painted. Now make the exhaust pipe shield by warming a piece of 20 thou plastic card, bending it round a piece of 3/32 inch dowel. Cut to length and cement to the cockpit side.

The extra louvres on the bonnet, etc, proved to be rather a headache. You may have your own solution, but if not, you may care to try the method I used. I looked around for a cellophane bag with crimped ends with approximately the right spacing to represent the louvres. This crimping was then cut to size and cemented into the various positions as indicated on the drawings. The main filler cap with quick release is made from the spare wheel hub nut with one arm removed. The other two filler caps are made from the moulding 'pips' on the sprue. The windscreen can next be made. This can be from one piece of clear styrene (from an aircraft stand) with the frames painted on, or, alternatively, the frame is cut from a piece of 40 thou plastic, and then the transparent screen is fitted to this frame. Two small holes are made in the scuttle and the screen is cemented in place after the paintwork is finished. Cut and fit the two intake flaps on the scuttle and the rear view mirrors. Cement the two halves of the petrol tank and when dry, cut a slice 5 mm wide out of the centre and re-cement inside the tail. Next cement kit part 12 at the back of cockpit.

You will now have to find a seat. This can be made from plastic or if you have a spare seat from another kit use this. I used a seat from a Viva kit rounded off at the top. This was then covered in thin leather (from an old pair of gloves). Paint the inside of the cockpit, and when all painting is complete, the seat can be fitted.

A piece of stretched sprue is cemented along the top of the bonnet to represent the hinge. Cut two new prop-shafts from stretched sprue and fit them to the flywheel housing at the front and to a point just inside the rear springs on the back axle. The body can now be painted. I used a mix of Humbrol Authentic Railway red with a touch of Railway maroon, and just a touch of matt blue. When the first coat has dried, carefully rub down with worn 0400 paper. At the same time carefully smooth the edges of the new louvres. When the second coat of paint has

Continued on page 578



Below: Two views of the completed model with (centre) the model prior to fitting wheels and exhaust pipe, but after painting.





Above: The completed conversion in its all-silver finish with constructors' number G37 as its only marking.

THE PROTOTYPE GLADIATOR

An attractive conversion
for beginners

by Stephen J. Kirby

Right: Full-size drawing for model showing the changes needed to the kit parts. (1) Build up new cockpit fairing. (2) Open cockpit with windscreen. (3) Reduced chord of cowl. (4) Altered rudder shape. (5) Cowled tailwheel. (6) Enlarged gun fairings.

THE prototype Gladiator first flew in September 1934 in the hands of Flt-Lt P. E. G. Sayer. It was a fairly conventional biplane, with a radial engine, fixed undercarriage, open cockpit and four guns. Further development gave it a closed cockpit and other refinements. Later on, Gladiators saw active service in World War 2. The Airfix Gladiator can very easily be converted to prototype configuration. The differences are: open cockpit, short chord engine cowl, different rudder shape and non-streamlined wheels. If you already have a Gladiator made up, this conversion can still be done successfully. For the real novice this is an ideal introduction to kit converting, but it makes an interesting model even for more experienced modellers.

Open Cockpit

(1) Cut out the flat interior including the 'pilot' (after prising off the canopy, in the case of a ready built). Now, using thick plastic card, cover this cavity from the rear fairing forward to the panel groove about halfway along the cockpit side. Build up the plastic to about half the height of the rear fairing and let dry.

(2) When dry, sand or file down the rear fairing to about half its original height, blending it in with the fuselage and the plastic filling, adding extra material as required (see photo).

(3) For the seat almost any spare will do (or one can be fashioned from plastic card). By using a balsa block or even a lump of Plasticine, stick the seat in position so that when a pilot is seated in it, the top of his head is just above the level of the rear fairing. A split pin pushed into the wood or Plasticine just in front of the seat makes quite an acceptable control column.

(4) The windscreen is quite simple. Just cut the front 1/16 inch off the kit canopy and cement in place.

The Engine

(1) File or sand the back of the engine so as to reduce its thickness to 5/16 inch. Put a 45 degree chamfer on the inside of the engine with a sharp knife, fit the propeller, if not already

done, and cement the engine to the fuselage.

The Rudder

Sand the rudder to the shape shown.

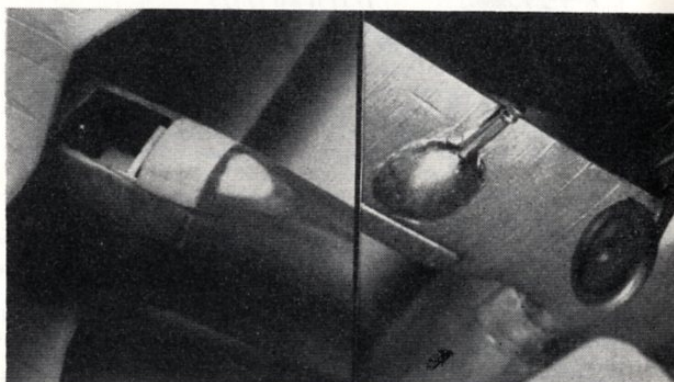
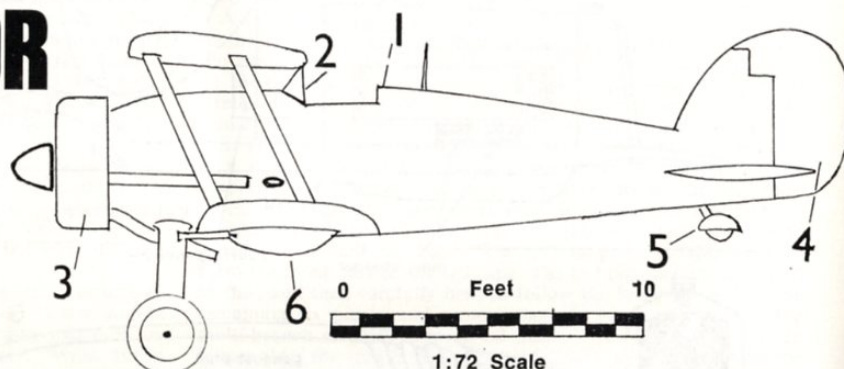
The Undercarriage

(1) The wheels on the prototype were of the non-streamlined type. I used the ones off a Hart. (Those left from an Osprey floatplane conversion will do fine.)

(2) The tailwheel is a cowled type and so a dab of body-putty, forming a dome over the top half of the wheel is all that is required here.

Guns

These were drum-fed Lewis machine-guns and so the underwing fairings need to be increased in size. Use body putty for this and build up to the shape shown in the picture.



Left: Close-up of the altered cockpit with modified fairing shape (note plastic card) and added seat and control column. Right: Enlarged gun fairing under wing and wheels from Hart/Demon kit. You could use the Gladiator kit wheels at a pinch.

Other Items

- (1) Fill in stand slot if this is not to be used. Scrap plastic and body putty is used here.
- (2) Add a 1/4 inch aerial, 1/4 inch behind cockpit.

Finishing

(1) Paint the aircraft silver all over except for a bronze-grey band 3/32 inch wide around the front of the engine cowl to depict the collector ring area.

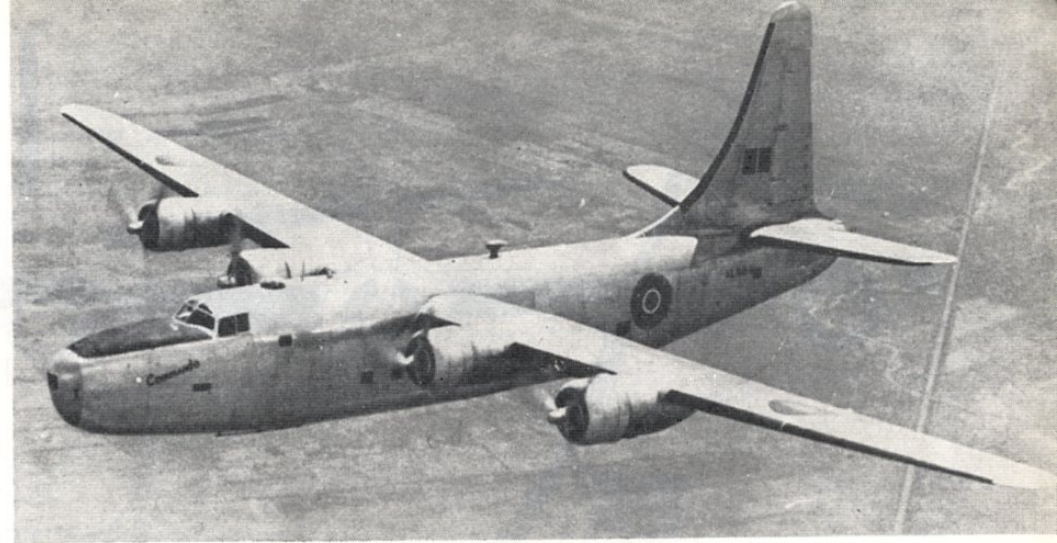
(2) The only markings carried initially were G37 in giant letters on each side of the fuselage. These are 1/2 inch high on the model and come from the Yeoman/Hales range.

(3) Paint the propeller grey, the tyres and engine dirty-black and the pilot's seat and headrest leather-brown.

Continued on page 583

AIRFIX magazine

Churchill's famous Liberator LB30 'Commando'. This aircraft was lost in an unexplained accident in the south Atlantic after the war (Imperial War Museum photo).



Make a Liberator transport

A project for advanced
modellers

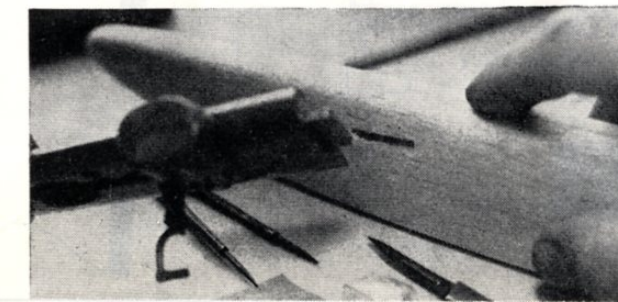
BY ALAN W. HALL

THIS month's conversion started out with many good intentions but ended up with a fuselage made almost entirely out of balsa wood. For although looking as if all the changes needed were a new tail unit the Liberator transport in entirely different apart from the wings, props, and undercarriage. So this is a conversion for the more advanced modeller unlike last month's simple Halifax transport.

Readers will appreciate that in doing a conversion model once a month leaves little time for experiment and on reflection I could have used more of the fuselage for this conversion. The result would have been a more satisfying model to the plastic modeller but it presents added problems from the constructional point of view.

One of the almost insurmountable difficulties in this conversion is the position of the wings which have been moved further back from those on the bomber. By cutting a section out of the fuselage, filling all of the apertures and then cutting fresh holes for the cabin windows one could possibly have got away with using more of the original kit. Even so the nose and tail section of the fuselage would have had to be made from wood and the joining of the three separate sections could have provided so much work that my model would not have been finished within the time limit. I therefore elected to make the entire fuselage out of balsa and take the easy way out of using black transfers for the cabin windows. Anyone with more time at his disposal, could work in the way outlined above. However, having then decided that a balsa fuselage is necessary let me now describe how I built this model.

Adding the wings to the fuselage. Note that the slots are cut into the balsa but that the wing joints will have to be finished off with a liberal quantity of plastic wood to fill the gap.



STAGE 1 The fuselage was cut from a block of balsa 12 1/2 inches long by 1 1/2 inches wide and 2 inches deep. The shape including the cockpit area, but not the tail unit was traced from the side view and transferred to the wood. I made sure that I had sufficiently clear guide lines from which to cut out the shape by drawing round the pencil marks with Biro. The problem in the cutting is to keep the fret-saw blade vertical for the whole of the operation or otherwise you will be left with a lop-sided fuselage. I did this work by only doing a few cuts at a time, checking all the way that the correct angle was being maintained.

STAGE 2 The fuselage contours are then roughly produced by cutting surplus wood away with a chisel. I used an inch wide tool for this and followed up with some very coarse glasspaper. This operation takes a long time to do satisfactorily and should not be hurried in any way. Accuracy is the keynote as the entire character of the eventual model can be destroyed if this stage of the operations is not carefully considered. When the final shape was achieved a very thick coating of clear dope and talcum powder was applied and rubbed down roughly before starting the next stage.



Fitting the tail unit. The rudder and elevators have been cut from the rest of the tail unit and prepared separately.

STAGE 3 The cockpit area, nose wheel well and slots for the wing stubs were then removed. To do this I used a drill starting with an 1/8 inch bit and working down to the finest I had to complete the corners. Finishing was accomplished by cutting with a knife and where possible sandpaper. Both the wheel well and the cockpit were left fairly rough as I needed somewhere to add a considerable amount of lead to weigh the nose sufficiently to keep the model on its tricycle undercarriage.

STAGE 4 Adding the extra weight was interesting. I took a chance and by cutting up a number of small pieces of lead heated them on an old tin lid bent to a point at one side. The lead melted easily in the heat of the electric stove and I

Continued on page 578

Scale drawings on next page

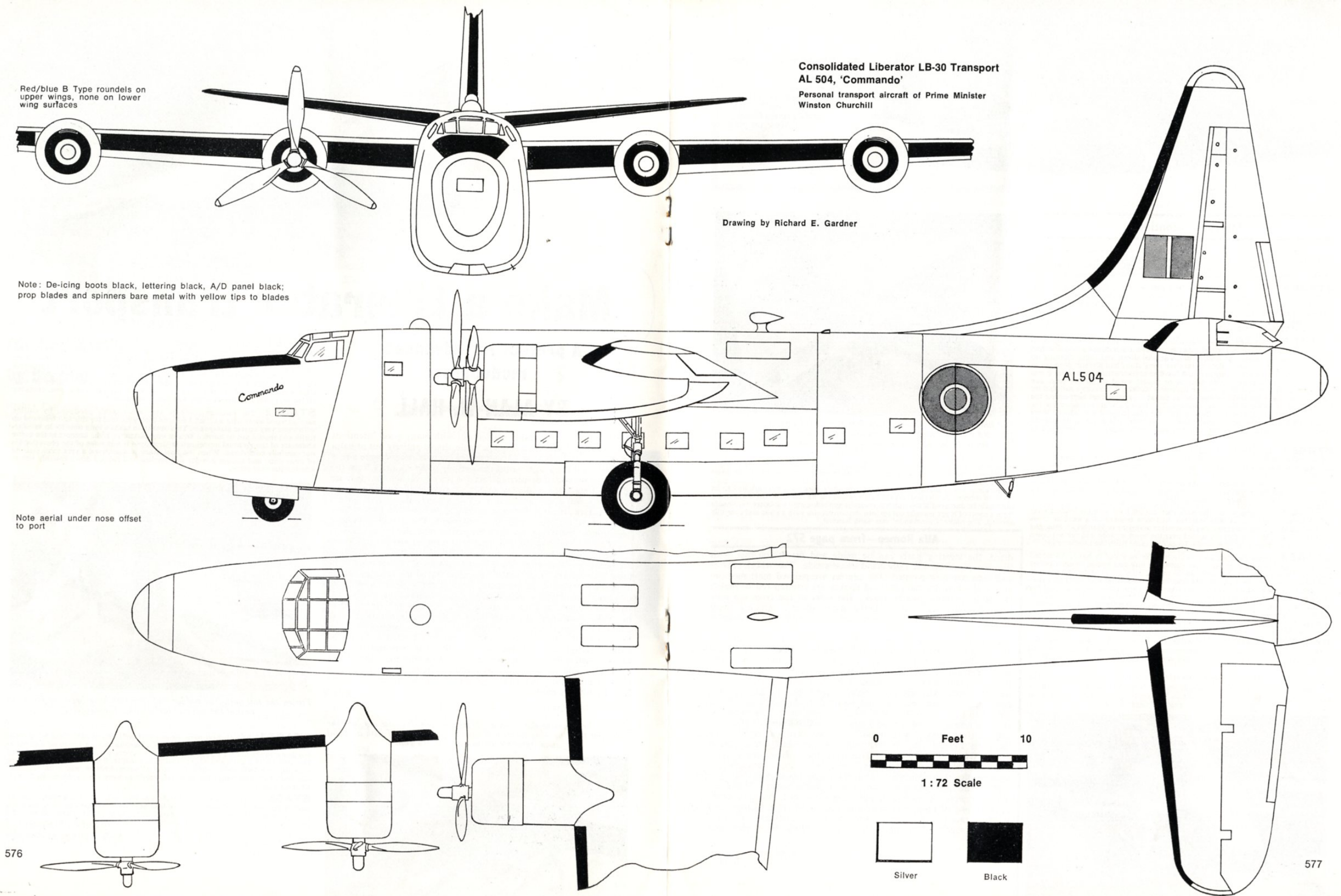
Red/blue B Type roundels on upper wings, none on lower wing surfaces

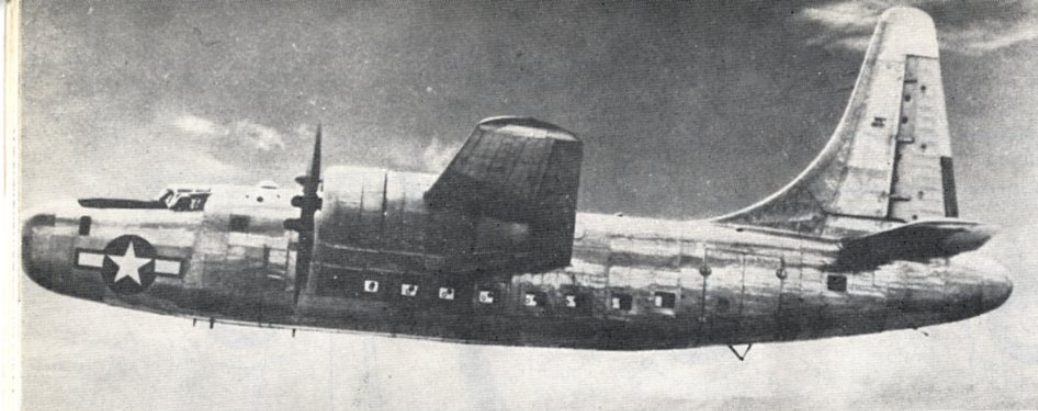
Consolidated Liberator LB-30 Transport
AL 504, 'Commando'
Personal transport aircraft of Prime Minister
Winston Churchill

Drawing by Richard E. Gardner

Note: De-icing boots black, lettering black, A/D panel black;
prop blades and spinners bare metal with yellow tips to blades

Note aerial under nose offset
to port





Liberator—continued

poured the liquid into the two holes above and below the fuselage. There was a great smell of burning but when the lead cooled I was left with two solid blocks which fitted the confined spaces and at the same time had smoothed off the walls of both compartments which although singed were exactly as I wanted them.

STAGE 5 Next I cut out the fin and rudder and tailplanes from 1/4 inch balsa sheet and sanded an aerofoil section on each. The rudder and elevators were cut from the original shape with a very sharp knife so that the balsa wood was not damaged and their fore edges rounded. Each part was then given the talcum powder and clear dope treatment and sanded smooth before being attached by balsa wood cement to the fuselage.

STAGE 6 Next came the wing attachments. These had been made up complete with undercarriage legs whilst other parts were under construction and had been prepared by having the leading edges sanded down and other cleaning up operations done previously. Slots to take the wing stubs had already been cut at Stage 3 but because of the contour of the fuselage at their attachment point it was necessary to add a considerable amount of plastic wood to fill the large gap between the fuselage and wing root on the upper surface. To ensure a satisfactory joint I glued the wing stubs in position as far as they would go supporting the fuselage and wings whilst the joint dried out. This took 24 hours to ensure that the material had adhered satisfactorily and then the plastic wood was added. More than was necessary was applied as this material shrinks during drying. Another 24 hour wait was needed before the joint was sufficiently strong for shaping operations to begin.

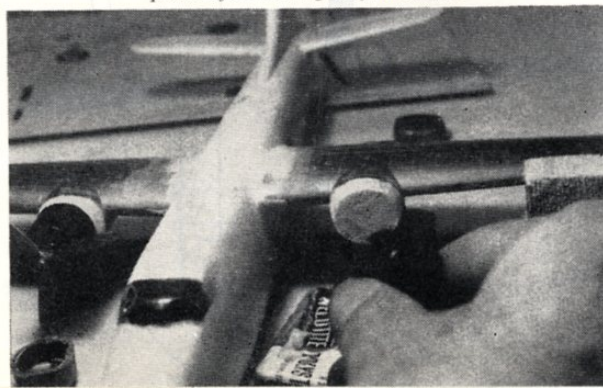
STAGE 7 The canopy was fitted next. This had been used as a template in the general shaping of the fuselage but now it was necessary to make sure that the unit was fitted snugly into its destined area. Body putty and a little more plastic wood was used round the edges to obviate any gaps and the result sanded smooth. Inevitably scratch marks appear on the canopy when working in this manner and I removed them by polishing with a very fine 'wet and dry' paper followed by vigorous rubbing with Duraglit metal polish.

STAGE 8 The engine nacelles were then cut off level with the leading edge of the wing, a small balsa plug inserted, and new engines of a circular cross section added. I found that examples from either a Stirling or Halifax kit fitted the requirements. Filler was liberally spread over the balsa sections and rubbed down so that the joint lines were eliminated. Propellers came from the Liberator kit.

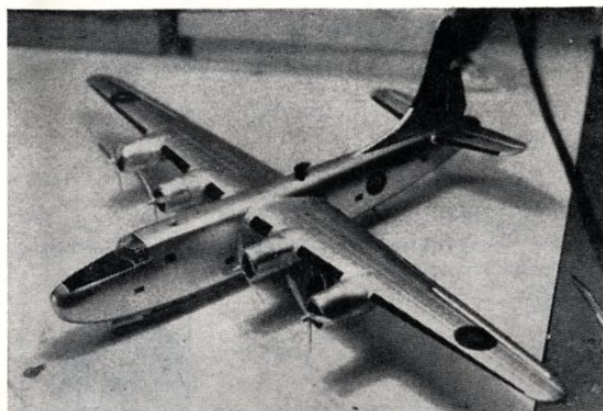
STAGE 9 Final cleaning up operations were now put in hand. An added polish was given to the fuselage, wing roots, tail unit and engine mounts before painting. Details such as D/F loop, radio masts, SBA aerial under the fuselage and nose wheel strut were added. The lead in the nose wheel well made an excellent fixing for the strut which was used direct from the kit with the horizontal bar at the top removed. A hole of similar dimensions as the strut itself was drilled into the lead and whilst the metal was still hot the strut was inserted. The heat welded the polystyrene to the lead resulting in a very solid joint. A rear fuselage 'tail bumper' was made from plastic card and stretched sprue. The astrodome on top of the fuselage came from a discarded Airfix Hercules part rubbed down.

PAINTING AND MARKINGS This model is ideal for spraying with an aerosol spray can. Care will however need to be taken to ensure that the black leading edges of the wings and tail unit plus the nose anti-dazzle panel are

Construction of the new engine nacelles in various stages. Those on the left have been completed whilst the one in the centre has been roughly cut to shape. That on the right shows the small block of balsa stuck in place before carving the final shape.



The USAAF version, known as the C-87, was basically the same as the RAF's Liberator IX. It was also used by the US Navy, one of whose machines is shown. 'NAVY' and small serial is painted on tail in black. (Imperial War Museum photo).



The finished model. Dri-dec transfers were used and the silver was applied by aerosol spray. Windows in the cabin area were stuck on after being cut from black transfer sheet. Name and canopy details remain to be added.

Painted and masked off first. Sellotape is used for this and also over the canopy. Wheels were painted separately and not fixed in place until the rest of the paint work had dried.

Markings were equally simple. Dri-dec roundels were used but care had to be taken in rubbing down those on the fuselage and the fin flashes as the balsa wood can easily be damaged if too much pressure is applied. Cabin windows were made from a sheet of black transfer cut up into the correct size with a knife and carefully applied. The name 'Commando' was hand lettered.

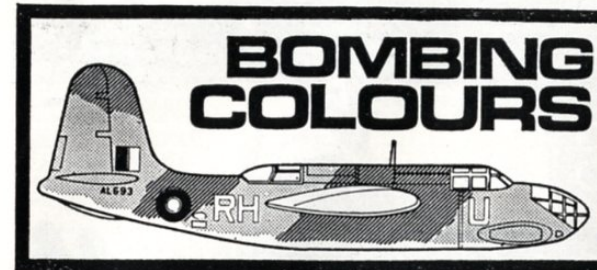
Alfa Romeo—from page 572

dried, the steering parts can be made and fitted, together with the two pipes on the right-hand chassis side. The wheel centres and hubs are now painted. The centres are painted matt medium grey and when dry the rims and spokes are painted red to match the body, or these can be black. The sides of the tyres are now painted matt black, and the brake drums silver to which a small amount of gloss white has been added. Exhaust pipe is painted a dull bronze/black colour.

Cement the wheel halves together and when dry carefully file and sand the joint and also sand the tyre to a little more rounded profile. The rest of the tyre can now be painted matt black. The radiator front is now painted matt black, also the 16 'slots' on the grille surround. The surround is then painted silver along with the front axle, starting handle, wheel hubs, etc. The steering column, wheel, seat, etc. can now be fixed in place and the wheels affixed to their axles. The final touches, ie, white racing numbers, etc. can now be fitted. I used Letraset numbers, but any transfers can be used, and if you decide to make your car one of the 'Scuderia Ferrari', the Ferrari prancing horse insignia is placed at the front of the bonnet. These are taken from the Airfix/MRRC motor racing transfer sheet. Note that numbers are applied direct to paintwork, and not on to black discs.

Paint the hub nuts silver and fit them to the wheels. That's all. You can now sit back and admire your work! As a point of interest, one of these cars is now owned by Mr Neil Corner, and is often raced at Vintage Sports Car Club meetings, with considerable success. This particular car has black wheel rims and spokes.

AIRFIX magazine



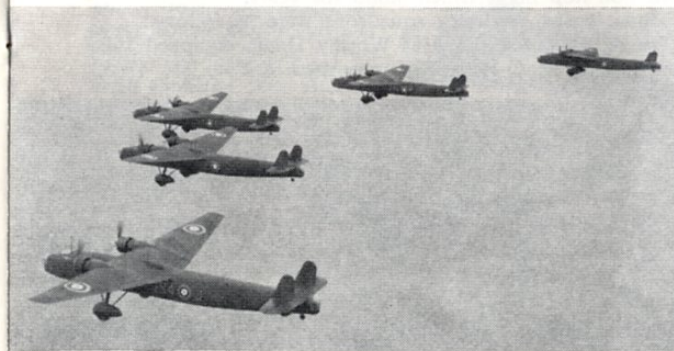
Part 17: Harrow and Wellesley

HEAVY bombers had long worn camouflage of a sort, for the Nivo finish was actually intended as camouflage. But it was on aircraft of the expansion period of the 1930s that disruptive camouflage was introduced on all aircraft to render them difficult to see from above and in the dark. From April, 1937, all land-based operational aircraft were ordered to leave the factories in camouflage of rough matt dark earth and dark green dope applied in disruptive patterns. The Ministry laid down basic patterns to be followed in planning of the aircraft finish. Light and medium bombers had patterning similar to that of fighters whereas heavy bombers—particularly the Whitley—had more elaborate designs. On their under-surfaces all the bombers were to be 'night'—matt black—on which large white serial numbers were painted.

Another major change was the introduction of a new roundel for peace time use, the Type A1 with its yellow surround to the blue-white-red that had lasted so long. A peace-time feature, it made the aircraft very conspicuous, and was applied to fuselage sides and above wings. Black serial numbers were still applied eight inches high on the fuselage sides and on the rudders.

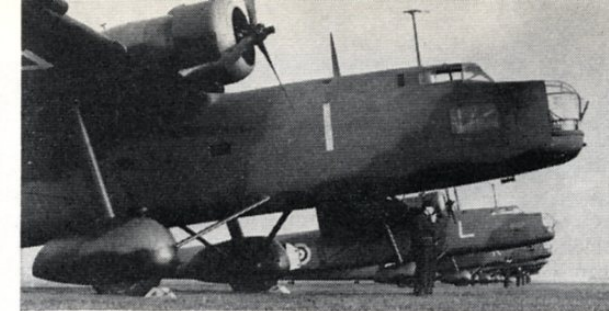
Unit markings on the new types consisted of the squadron number usually ahead of the roundel with an individual letter aft. Generally these markings were medium to dark grey, but some aircraft are known to have carried yellow squadron markings. Squadron badges or some unit crests were sometimes to be seen—114 Sqn had them on the standard 'bomber' grenade marking (see Part 14) on the fin for instance, and some of the Whitleys had them on the nose.

About September 25, 1938, a new feature appeared. With the autumn crisis upon them the bomber squadrons were



A formation of 214 Sqn Harrows in May 1938. None have the dorsal turret in place. Its position was at the end of the dorsal fairing ('Flight International' photo).

August, 1970



Harrows of No 214 Sqn lined up in May 1937. 'L' is K6993; she served with the squadron from September 1937 until July 1939. She had a very eventful wartime career with 420 Flight during Operation Mutton (mine laying in the face of German bombers) and served with 271 Sqn until her destruction on January 1, 1945, during a fighter-bomber raid on Evère. 'I' in the foreground is K6987 and 'K' is presumably K6989 ('Flight International' photo).

ordered to paint out all unit markings and in their place came unit code letters, two letters identifying the squadron and one letter for the individual machine. The letters were grey. Some units, however, did not adopt code letters until March-April 1939.

Another change seen at this time of serious crisis was the application of Type B roundels in place of the Type A. The red-blue roundels were of smaller diameter than those previously carried and on many aircraft one could see very visible traces of the former brilliance. No rules can really be laid down about these new markings for they were introduced at different times and in differing manner by the stations. Suffice to say that some units adopted them in the September crisis, while some held their hand until the war clouds gathered in March, 1939, when the Battles seem to have adopted them. But the official date for their general adoption on all operational aircraft was April 27, 1939. On this date all roundels on the fuselage and upper surfaces of operational aircraft were ordered to be Type B, whilst under the wing tips Type A were prescribed. Again the order does not seem to accord with the event for lots of bombers were flying without under wing roundels until after the start of hostilities. Under wing serials were a usual feature, although again on some squadrons these were painted out, sometimes with a light wash, such a change also applying to the fuselage serials on some aircraft.

The first production bomber to wear camouflage finish was the Handley Page Harrow. Its origin lay in the HP51 troop carrier which flew in 1935 and from which the Harrow emerged via Specification 29/35. Behind this lay the idea that the Harrow should be built quickly providing a relatively high performance monoplane bomber in service whilst the Wellington was being developed. It was therefore an interim replacement type for the Virginia, upon which crews could be trained for the more advanced type coming along.

K6933 was the first example to emerge wearing the matt green-brown-black finish with A1 Type roundels, white under wing serials and black serials on the fuselage and rudders. Its maiden flight came on October 10, 1936. Two months later it went to Martlesham, along with K6934, for type trials.

K6935 arrived on 214 Squadron on January 13, 1937, the first in camouflage finish to reach a squadron. No. 214, based at Feltwell equipped between January and March with K6936-K6945 inclusive.

All the Harrows up to K6952 were Mk 1s, powered by two Bristol Pegasus Xs, and of these K6946-6952 were de-

Continued on next page

Bombing Colours—continued

livered to 37 Squadron in March-April, 1937. They were followed by Harrow IIs (2 × 925 hp Bristol Pegasus XX) which bore the serials K6953-7032. Delivery of the Mk II spanned from May 10, 1937, to February 1938. The first machine, K6953, went to Farnborough and on the same day K6954 arrived on 214 Squadron. No 37 Squadron also received some Mk IIs then 115 at Marham equipped in June-July. Next it was the turn of 215 Squadron with K6975-6982. Thereafter 214 and 75 Squadrons received some Mk IIs and some other aircraft were delivered as replacements for earlier aeroplanes.

In service Harrows generally adopted the usual grey number-letter combination of which the squadron number was placed ahead of the fuselage roundel on both sides of the aircraft. No. 214 Squadron had its aircraft letter painted on both sides of the nose like 37 and 115 Squadrons. When the crisis broke in September, 1938, some of the Harrows acquired Type B roundels. Some that I saw had their under-wing serials painted out with a light wash. Grey code letters superseded the squadron numbers. In the air Harrows gave the impression of being very large aeroplanes, and formations of them which toured the country prior to the 1938 Empire Air Day were an impressive sight—particularly when they roared across very low.

Plans were made to re-engine the Mk Is but only six were so modified, K6933, '35, '36, '37, '38, '39. Of these K6933 became G-AFRG, retaining its camouflage when in civil guise. This and K7027 (G-AFRL) and K7029 (G-AFRH) were used for in-flight refuelling experiments for trans-Atlantic flight.

Harrows served the squadrons until the summer of 1939 when Wellingtons replaced them. After a period of storage in MUs, where most found themselves on the outbreak of war, the Harrows were used by Nos 7, 8 and 9 Air Observer Schools and later Nos. 8 and 10 Bombing and Gunnery Schools. A number were converted into transports, for use by 271 Squadron almost to the end of the war.

Bomber squadrons equipped with Harrows were as follows:

No 37 Squadron based at Feltwell, used Harrows April, 1937, to June, 1939. K6956 was 37-V, K7001:37-S and K7016:37-X. Aircraft later coded FJ.

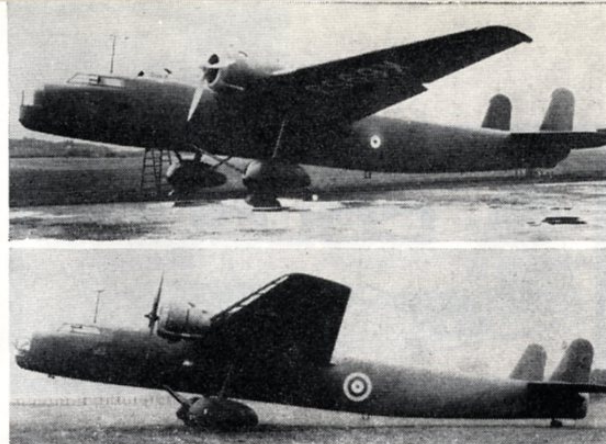
No. 75 Squadron based at Driffield moved to Honington July, 1938, used Harrows September, 1937, to July, 1939. K6947 was 75-X. Aircraft later coded FO.

No 115 Squadron based at Marham used Harrows June 1937 to June, 1939. K6962 in use June, 1937, to April, 1939, was 115-M. Squadron had a repeat of the aircraft letter on the nose. Aircraft later coded BK.

No 214 Squadron based at Feltwell was equipped from January, 1937 to July, 1939. K6987 was 214-L, K6989:214K, K6996:214-H. Squadron had a repeat of the aircraft letter on the nose. Aircraft later coded UX.

No 215 Squadron based at Driffield moved to Honington July, 1938. Was equipped with Harrows from August, 1937 to June, 1939. K6974 was 215-Y later 215-G, K6975 was 215-H later 215-R. Aircraft later coded BH of which K6980:BH-D is an example.

The second type to emerge in camouflage was the Vickers Wellesley. Its origin lay in Specification G.4/31 for a general purpose bomber to which Vickers produced two designs, a biplane and a monoplane of geodetic construction. The latter was very successful and in September, 1935,



Top: K6953, the first production Harrow II, initially employed at RAE and with 214 Sqn from October 1937, until she was transferred to 75 Sqn in July 1939. Her wartime use was at 9 AGS and 10 BGS. **Above:** K7005 before she entered 37 Sqn on November 9, 1937, where she served until May 1939. She also had an eventful wartime career, with RAE, 93 Sqn, and 271 Sqn with which she served from August 1941 until December 1944 (Imperial War Museum photo).

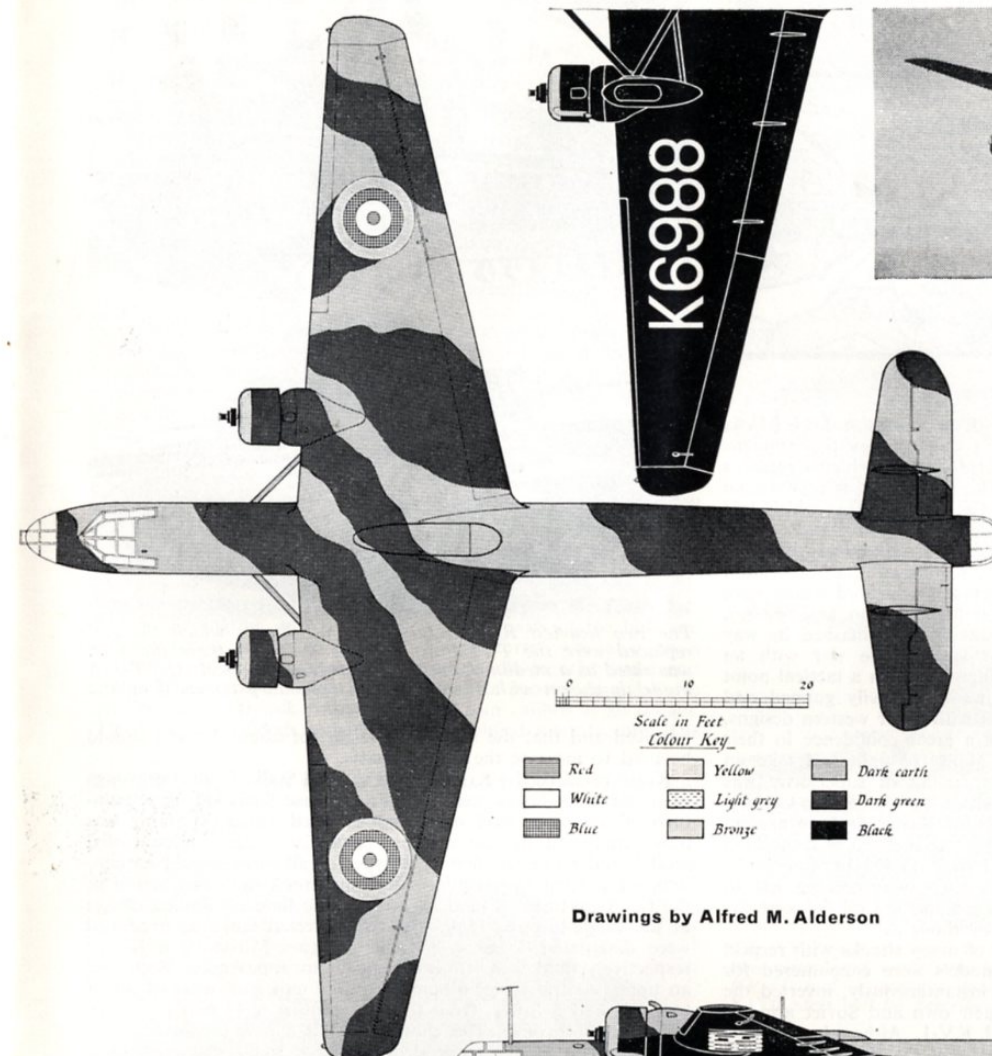
an order for production aircraft was placed. Following an accident the G.4/31 monoplane was rebuilt as K7556 the all-silver prototype Wellesley.

K7713 the first production machine flew on January 30, 1937 in dark green/dark earth/black camouflage with white under wing serials and Type A1 roundels. It had the typical bronze coloured exhaust collector ring of those days. Like the Harrows, Wellesleys left the production line in A and B camouflage patterns, one the mirror image of the other and applied to alternate machines. On March 18, K7713 passed to Martlesham for type trials. K7714 was delivered to 76 Squadron at Finningley on March 25 and gradually that squadron was equipped. As with the Harrow the Wellesleys' service—at home, at least—was brief and they had left the squadrons before the war commenced, by which time they were in storage or in the Middle East.

Three batches were built: K7713-7791 delivered to squadrons between March and October 30, 1937, K8520-8536 delivered October-November, 1937, and L2637-2716 delivered February, 1938 to May, 1938.

The best known Wellesleys were without doubt those used by the Long Range Development Unit. In July, 1938, four of them (L2638, L2639, L2680, L2681) flew from Cranwell to the Persian Gulf then landed at Ismailia. Their most famous flight was one from Ismailia to Australia. L2638, L2639 and L2680 took off in November the first and the third reaching Darwin after 48 hours flying, a record non-stop flight which stood for years.

Home based Wellesley squadrons were as follows:
No 35 Squadron based at Worthy Down equipped July-Sept 1937 to May, 1938. Examples used: K7736, '38, '47-'52,



Drawings by Alfred M. Alderson

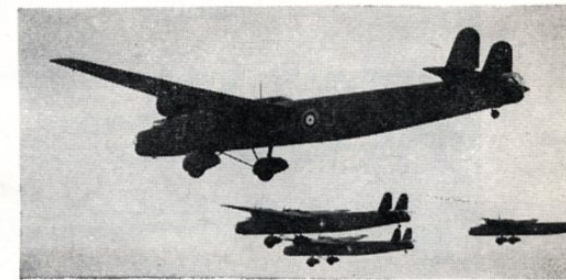
Below, Left: Wellesleys of 45 Squadron over Cairo on May 11, 1938. The 'A' and 'B' camouflage patterns are in evidence and the aircraft include K7783 nearest, K7772 and K7777 (MoD photo). **Right:** Wellesley L2640 completed in March 1938, was despatched to the Middle East in July and joined 14 Sqn during August 1938, in standard bomber finish (Imperial War Museum photo).

'54-'55, '68, '70. K8530 was 35-G, squadron marking applied number forward in flight colour (red) outlined black with white 'G' aft. Re-equipped May, 1938.

No 76 Squadron based at Finningley equipped March-July, 1937. Examples used: K7714-20, K7735, '52, '67, K8522, K8531, L2641. '76' aft in flight colour outlined yellow. Aircraft later coded NM, eg, NM-H:K7748. Re-equipped April, 1939.

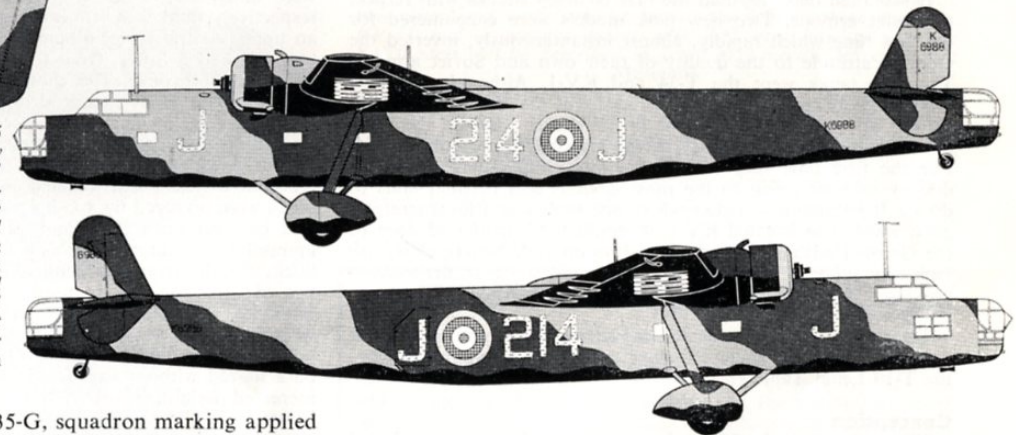
No 77 Squadron based at Honington moved to Driffield July, 1938 equipped October-December, 1937. Examples used: K7787, '89, K8524, '25, '34-'36, '47-'48, L2642, L2679,

Continued on page 590



Above: A formation of Harrows was an impressive sight—particularly if they were flying low making their slow, stately progress. 214:J, subject of the drawing on left, is nearest, while 214:G leads ahead of 214:K ('Flight International' photo).

Left: Harrow II K6988 of 214 Squadron. She reached 214 Sqn on Sept 14, 1937, and retired to 9 MU on June 26, 1939. Her war service was rather mundane, for she served in 1939 and 1940 with HQ Flight Training Command. An interesting point about Harrow camouflage was that the under surface black or 'night' area terminated in a wavy line. Codes were 42 inches high, and underwing serials 54 inches. Upper wing roundels were 84 inches in diameter, fuselage roundels 56 inches.



STALIN TANK

by

JOHN MILSOM

Part I: KV development

THE previous series on the development of the T-34 (*Airfix Magazine*, June-November 1968) showed how the Russians adopted certain attitudes to mechanised warfare which were of a unique and noteworthy character. These attitudes were reflected in the requirements of the 1940-41 Tank Programme which laid down excellent characteristics for tanks of three classes—light, medium and heavy. Resulting from the far-sightedness of these requirements, coupled with the pure genius of that generation of Soviet tank designers, new tank models appeared which were to have an hitherto unprecedented influence upon tank design.

The armoured might of the Wehrmacht had smashed its way through Europe during the early stages of the war with an obvious qualitative superiority of equipment from a tactical point of view. Their tanks were well armoured, heavily gunned and fast and manoeuvrable in comparison with other western designs. This gave the German Panzer crews a great confidence in their equipment, thereby enhancing their ability to fight and take on ordinarily risky tasks. This German feeling of superiority was enhanced during the early tank battles of the Russo-German conflict, when 'slaughters' of masses of Soviet armour around Minsk and Kharkov led the Germans to believe that nothing could stop them; they had counted over 17,500 burning hulks on the plains of Russia and—surely there was nothing left to fight? The roads to Moscow, Stalingrad and the oil fields of the Caucasus lay at their feet—or so they thought.

It was then that they had the first of many shocks with respect to Soviet armour. Two new tank models were encountered for the first time which rapidly, almost instantaneously, inverted the German attitude to the quality of their own and Soviet armour. The new tanks were the T-34 and KV-1. Although the T-34 aroused great admiration from all ranks of the Wehrmacht, from private up to Field-Marshal, it by no means instilled the same fear into the German soldiers as the massive, impregnable KV-1. For the first time they had met a tank which they could not destroy without going to the most devious and peculiar ends to do so. It became a situation where one tank was a local strategic goal, where one isolated KV tank could hold up the advance of the German advance columns for days on end. Nevertheless, this tank—in spite of its heavy armour and superior firepower—possessed a manoeuvrability and speed not markedly inferior to its lighter companion, the T-34.

Thus the KV tank made its impact on the armoured warfare scene and we will trace its story up to its latest derivative—the T-10 Lenin Tank.

Conception

The story starts in 1938 when a group of engineers selected from the Kirov-Zavod tank plant at Leningrad were placed under the direction of Z. Ya. Kotin and N. Dukhov, and were ordered by Stalin to develop a new multi-turreted heavy tank to replace the T-35 series which had been in service in small numbers since the early 'thirties. The T-35 was similar in style to (and probably inspired by) the British 'Independent' tank.

During 1938 the new heavy tank specification was drawn up, and a heavy tank project was put forward by the group under Kotin. Two models were originally suggested, each having three turrets and thus following the multi-turret tradition of the T-35. Kotin took drawings of these tanks to Stalin, who was intensely interested, but suggested that one of the turrets should be



The two heaviest Russian tanks of the 'thirties which the KV replaced were the T-28 (top) and the T-35. Of these the T-28 was rated as a medium tank despite its large physical size. T-35A model is shown with 45 mm gun in secondary turrets (Imperial War Museum).

removed and that the saving in weight (of about 3 tons) should be used to increase the armour basis.

Kotin revisited the Kremlin and showed Stalin further drawings of three new heavy tank projects; these included two twin-turreted concepts and one single-turreted concept. Stalin was most impressed by the designs, particularly the single-turreted model, and requested that prototypes of all three should be constructed as soon as possible. Kotin undertook the construction of the two twin-turreted models, at the same time continuing design of the single-turreted tank. The twin-turreted tanks so produced were designated T-100 and SMK (Sergius Mironovitch Kirov) respectively, and were almost identical in appearance. Both had an upper central turret mounting a 76.2 mm gun, with all-round traverse, and a lower, front turret mounting a 45 mm gun, with 180 degrees traverse. The chassis utilised a new torsion-bar suspension, with eight independently-sprung, small diameter bogie wheels on each side. The upper track was supported by four track-return rollers on each side. A new, very wide, cast track was used with heavily-spudded, small-pitch links. The tanks had crews of 6-7 men and weighed 56 and 45 tons respectively. Both tanks were powered by 400 hp petrol engines. The armour, which was cast on both hulls and turrets, was designed to provide immunity to 37 mm AP shot at all ranges, and was up to 60 mm thick. Results from the combat in Finland, where small quantities of these tanks were used (hence the erroneous designation of T-35C adopted by the Germans), showed that the designs were not what was required in this tank class.

It was demanded that increases in armour and firepower should be achieved without any deterioration of mobility resulting from increased weight. Thus, in the process of work on designing a heavy tank, the group of engineers (headed by Kotin) at Kirov came to the conclusion that a heavy tank with shell-proof armour should have only one turret and be armed with one very powerful gun.

The KV design

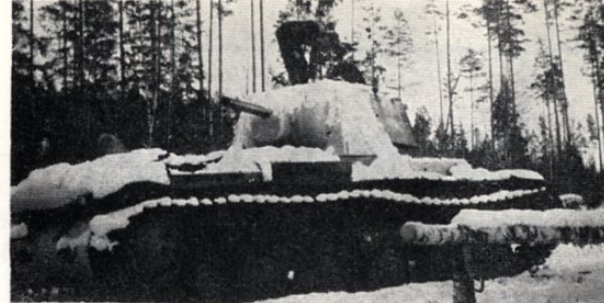
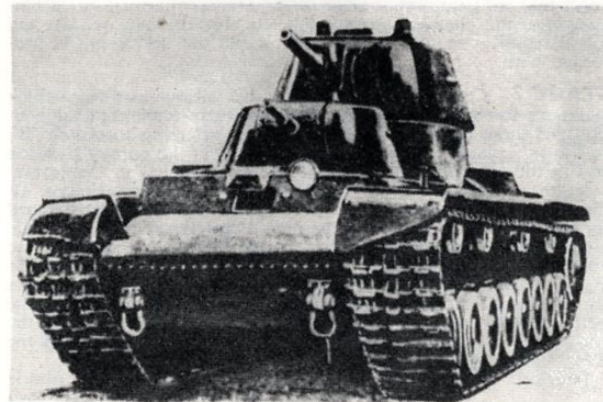
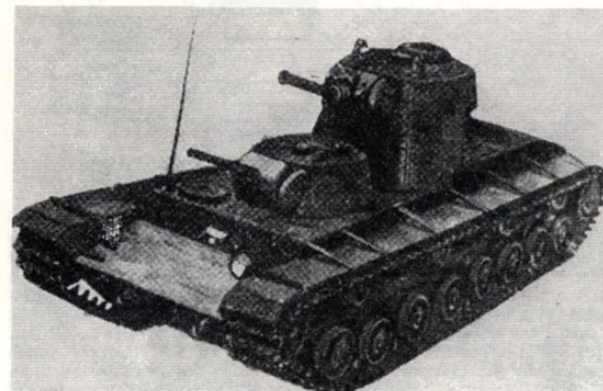
After completion of the single-turreted model, Kotin revisited the Kremlin where the design, provisionally called the Kotin-Stalin, was selected for development and renamed the KV (Klementi Voroshilov) after the famous Red Army general. Stalin approved the design except for the armoured skirting planned to protect the suspension. Kotin and the designers were keen to retain this feature but Stalin was emphatic—and not to be argued with! So the armoured skirts were dispensed with.

A new form of torsion bar suspension was developed for the vehicle subsequently. In September 1939, Kotin completed the prototype of the new KV, which Stalin accepted for production before the new suspension had been fully developed. Before large-scale production was undertaken, a limited number of these experimental heavy tanks were successfully employed along the Soviet-Finnish Front during December 1939. Production commenced during December 1939 at the Kirov tank plant, and the tank entered service proper during 1940. Mostovenko, the Soviet war historian, wrote:

... Further design work was directed towards producing single-turreted tanks mounting only one gun. This was an important step in determining a new way of designing medium and heavy tanks, and facilitating the production of tanks with shell-proof armour—not yet undertaken abroad. A saving in weight was achieved by the reduction in the number of turrets and in the internal volume of the tank by employing a smaller crew. This provided the necessary conditions for increasing the armour thickness without increasing the weight of heavy and medium tanks, in comparison with the T-28 and T-35... An artillery version of the KV, designated KV-II, was also produced but was not tactically successful.

The KV-1 took over the roles of both the T-28 and the T-35 heavy tanks. The Russians considered it to be the best tank in its class in the world at that time. This first model, the KV-1, was manufactured during late 1939 early 1940 at the Kirov factory at Leningrad, and had armour on all parts of the hull and superstructure up to 75 mm thick. The turret was also on a 75 mm basis, but used heavier armour on the mantlet and turret front. This massive armour was designed to provide immunity to artillery and anti-tank rounds up to 76 mm calibre at all ranges. The hull was welded, which greatly simplified manufacture. The

The SMK and T-100 (bottom) were similar multi-turret designs, but the T-100 was heavier and had wider tracks and heavier road wheels as shown here.



The KV-1 had the short L/30.5 76.2 mm gun, as seen in the top two views, and early vehicles lacked the hull machine gun. The KV-11 had a massive turret with 152 mm howitzers. These KV models will be described in detail next month (Imperial War Museum).

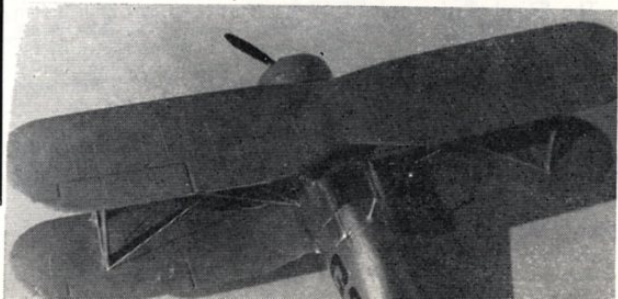
armament on this first model consisted of a 76.2 mm M-1938/39 L/30.5 tank gun, the same as used on the early T-34 medium tank. The KV inherited the steel-tired resilient bogie wheels and wide tracks developed for the SMK and T-100 tanks, but had the improved independent torsion-bar suspension already mentioned. It also used an early version of the same 500 hp Model V-2, V-12 diesel engine as used in the T-34 tank, which enabled it to move extremely fast, in spite of its excessive weight.

Gladiator Prototype - from page 574

Rigging

This is simply done using sprue, stretched to a fine filament over a candle flame. Measure off the lengths of each 'leg' of 'wire' with dividers, add tiny blobs of cement at the attachment points on the aircraft and slip the 'wire' into place with tweezers. The model pictures show where the rigging wires are needed.

Top view of completed model with rigging added from heat-stretched sprue and added radio mast.



THE DORCHESTER COMMAND VEHICLE

Conversion from the Airfix
Matador kit

Described by Geoffrey W. Futter

THE 'Dorchester' Armoured Command Vehicle, official designation Armoured Command Vehicle (AEC) 4 x 4, entered production during 1941 to replace the armoured command vehicles which were to have been produced by Guy Motors on their 'Lizard' 4 x 4 chassis but, because of other commitments, could not be manufactured in the required numbers.

The AEC (Associated Equipment Company Ltd of Southall) chassis used for the 'Dorchester' ACV was the 12 ft 7½ inch wheelbase 0853 model with an AEC 95 bhp 6-cylinder diesel engine. This chassis was basically the same as that used for other AEC military vehicles of the time including the Matador Medium Artillery Tractor and Deacon SP 6-pdr anti-tank gun (featured in the February *Airfix Magazine*), but was fitted with the fuel tank on the nearside, a wireless generator in place of the winch of the Matador and special brackets on the chassis frame to carry the armoured body; 13.50 x 20 Runflat tyres were fitted as standard.

These specialised vehicles were used as mobile headquarters by the commanders of armoured formations and their staffs and by the Royal Signals in forward areas for providing wireless links with rear units, and two basic versions of the 'Dorchester' were produced, the HP (High Powered) model and the LP (Low Powered) which were fitted with long range and short range wireless equipment respectively. Some 'Dorchesters', mainly the HP version, were fitted with false projecting bonnets.

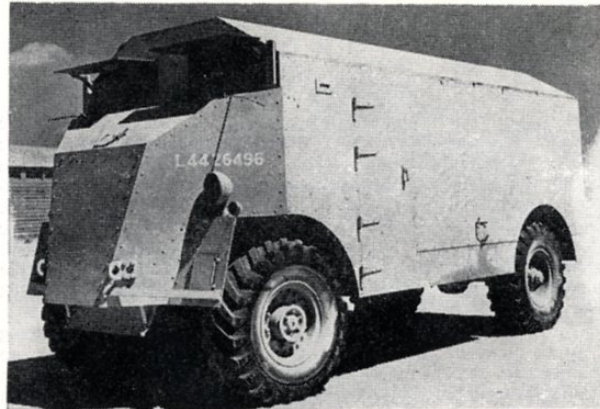
The armoured body, which was constructed of armour plate on steel framing, was of simple box shape with access doors in the sides and rear. The radiator armour was carried on brackets fitted to the forward end of the chassis members and two towing eyes were provided on the nose, these being fixed with bolts through the armour plate to secure the eyes to the vehicle chassis. Hinged armoured flaps with vision slots were provided over the driving windows and beneath the forward end of the vehicle was a curved shield to deflect cooling air to the radiator.

Other standard external fittings were the ventilators in the roof corners of the LP version, three hatches in the roof, a folding step below the rear door with two towing eyes on the body at the sides of the step and on the HP version curved plates were fixed over the sloping corners of the roof. Sections of aerial mast were carried in brackets on the offside of most HP vehicles. On early production vehicles a simple rolled canopy was fixed on the sides with a folding canopy frame below but on later production vehicles complete tentage was provided with the tent roofs in rolls on the vehicle sides and the remaining tentage carried in packs strapped in other locations as shown on the drawings. These tent extensions served as living accommodation or extra office space for the staff and crew.

Various other fittings were sometimes added when the vehicles were in service such as roof racks and fuel and water carriers. Installed in the armoured body were map tables, cupboards for equipment and maps and seats with safety harness for the staff in addition to the communications equipment.

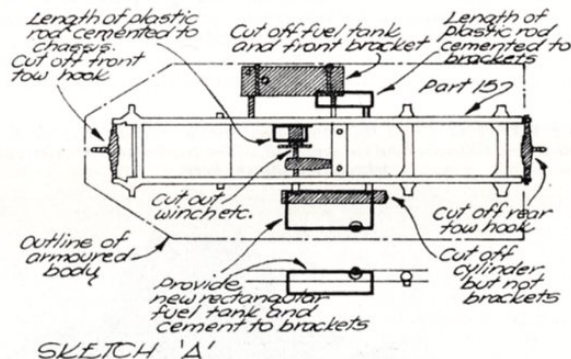
The 'Dorchester' was used in the North African and Italian campaigns and later by armoured formations of the 21st Army Group in North West Europe. Towards the closing stages of the war in Europe the 'Dorchester' was superseded in production and eventually joined in service by an AEC 6 x 6 armoured command vehicle which was also produced in HP and LP versions.

Stage by stage instructions for modelling either version of the 'Dorchester' follow and because of the simple nature of the work involved this could be an ideal subject for those new to military conversion modelling.



An armoured demolition vehicle in Middle East service. A similarity between the 'Dorchester' and the above vehicle type can be clearly seen. The absence of tentage and roof ventilators was standard and for operating some of the engineering equipment carried in the vehicle a roof hatch was provided at the extreme rear of the roof instead of the three roof hatches of the 'Dorchester' (Conniford Collection photos).

STAGE 1 From the Airfix Matador and 5.5 inch gun kit take the following parts: 15, 35 to 39 inclusive and 41 to 55 inclusive. Assemble these following the instructions in the kit but first cut the fuel tank, winch and the front and rear towing hooks from part 15 as shown on sketch 'A'.



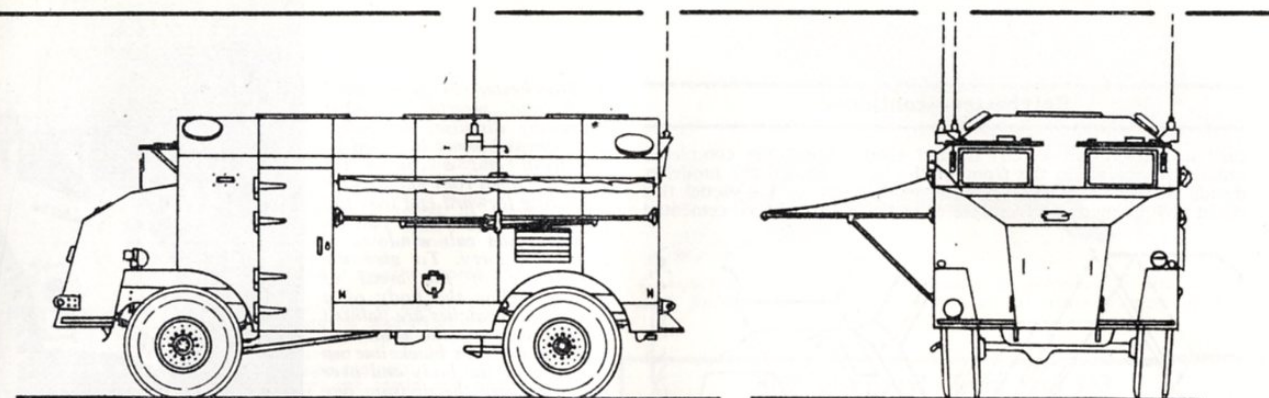
For the cylinder which replaces the Matador fuel tank and for the wireless generator in the winch position cut appropriate lengths off the cylinder which has been cut from the nearside of part 15 and cement in the positions shown on sketch 'A'. If a suitable piece of plastic cannot be found to represent the new rectangular fuel tank, fabricate this by cutting pieces of plastic card to the dimensions of the faces of the tank, cement together, and when set cement the new tank on to the brackets which remain on the chassis side member. Note that the top surfaces of these three new components to be added to the chassis should be in line with the upper edge of the chassis side members. This completes the chassis, transmission, etc. for the new vehicle and this assembly can now be set aside while the next stage is proceeded with.

STAGE 2 Cut from plastic card the various surfaces which make up the armoured body after carefully scaling the dimensions of these from the drawings and by referring to sketch 'B'. In the side plates cut out the wheel arches in the correct position and in the forward plates cut out the wheel arches in the correct position and in the forward plate cut out the window shapes. To the dimensions given on sketch 'B' cut out a piece of plastic card for the floor of the body and then the two narrow strips of plastic card which will support the body on the chassis. Cement all these body components together ensuring that the overall dimensions are as those measured from the drawings and that the corners are square before the joints have set. Carefully score with the point of a modelling knife or other sharp tool the outline of the body doors and also the joint lines in the armour plate on the body sides.

Fabricate the armoured radiator cover from pieces of plastic

Continued on page 586

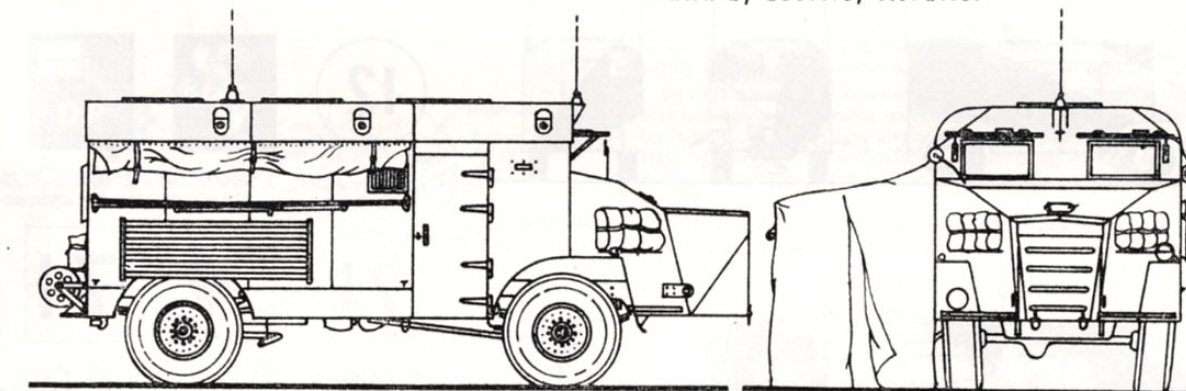
AIRFIX magazine



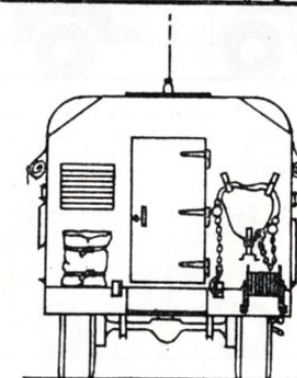
A.C.V. LP (AEC) 4x4

SCALE 1:76 (4 mm to 1 foot)

Drawn by Geoffrey W. Futter

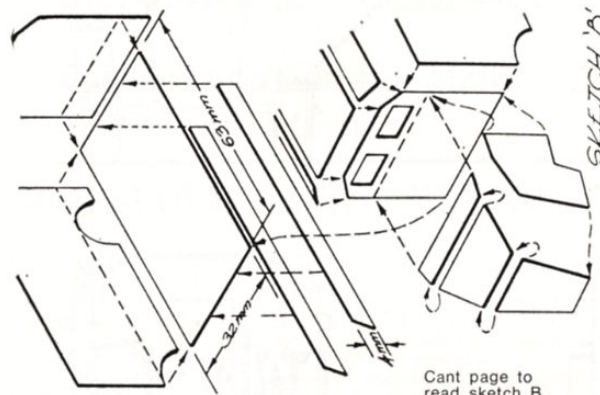


A.C.V. HP (AEC) 4x4



Dorchester—continued

card as shown on sketch 'B' and then cement the completed radiator cover on to the front of the body. Should the modeller decide to provide a false bonnet on the nose of his model this could now be made up from pieces of flat card and then cemented



Cant page to read sketch B

on to the armoured radiator cover. The shape of this false bonnet is clearly shown on the drawings of the HP version as is also the curved plates over the sloping corners of the roof. If the modeller intends to add these plates to his model, extra thin gauge plastic card should be used so that the right curvature can be obtained. Note the three oval holes in these plates on each side.

From thin plastic card shape the pieces required to form the front mudguards and cement into place in the cut-outs in the sides of the radiator cover.

After all the joints in the assembled body and radiator cover

A 'Dorchester' in desert sand finish and wearing a most interesting disguise. An imitation canvas bonnet is added to the front and a canvas tilt (note the open roof hatch) with projecting forward end over the top of the body. Black patches represent the cab windows of a normal lorry. To give the appearance of the areas of shadow below the body of a lorry, black patches are painted on the sides of the armoured body and a thin black line up the sides of the body and over the top where the division line between the cab and body of a lorry would be.

have set, fill any partially open joints or other defects with body putty and then sand as necessary to a smooth finish. Now cement the chassis (completed in stage 1) to the body in the correct position.

STAGE 3 The various standard fittings can now be added to the exterior of the vehicle and to aid the modeller in this a list follows suggesting ways in which these can be modelled. A full list is given for modelling the LP version and any fittings on the HP version which are in variance to these are given afterwards.

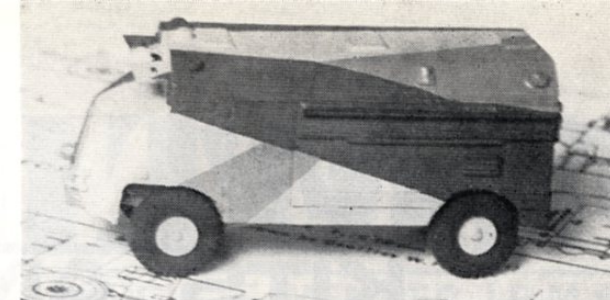
LP VERSION: Roof hatches and ventilators—cut from plastic card. Front and rear towing eyes—cut from plastic card with the holes formed by twisting the point of a very fine rat's-tail file into the plastic card. Flaps over radiator and fuel caps—cut from thin plastic card with very small pieces of card cemented on to represent the hinges and locking levers. Struts to mudguards—cut thin strips of plastic card. Hinged window flaps—cut from plastic card (note corner to be cut off on hinge line) with plastic card hinge straps cemented on and thin strips of plastic card for the struts. The small visibility slots may be carefully cut out or could be represented by painting with



LP Version (continued)

black paint on the finished model. Hinges and handles of body doors—cut from thin plastic card and cement in position. Louvred ventilators—narrow strips of plastic card cemented to the body or a flat piece of stout plastic card with the surface filed to represent the louvres. Rolled canopy—lengths of stretched sprue or plastic rod with thin paper wrapped round to represent the canvas. End plates cut from plastic card and cemented to ends of sprue or rod and to body sides in positions shown on drawings. Canopy frame—lengths of stretched sprue or thin plastic rod. Rear step—plastic card cut to size of step with narrow strips of plastic card for support struts. Lights on mudguards—cut from plastic rod after ends of rod have been rounded or use components left over from other conversion projects. Stowed tools on rear—cut spade and pick head from plastic card and use stretched sprue for crowbar and pick handle. Use narrow strips of plastic card as fixing straps. Towing hawser—form carrying brackets from narrow strips of plastic card and cement to body. Use fuse wire for hawser with fine chain if the modeller can obtain from his local model shop—if not use fuse wire only. Aerials—form brackets from plastic scrap and use fuse wire for aerials. Make knot in lower end of each fuse wire aerial and set knot in globule of cement on aerial brackets. **HP VERSION:** Tent roof—rolls of thin paper cemented along upper edges to body sides and with fine cord wrapped round for straps. Tent packs—form by folding thin paper and wrap fine cord around packs and then cement completed packs into position. Aerial mast sections—lengths of stretched sprue cemented side by side on body with narrow strips of plastic card cemented on ends as brackets. Cable reel—use length of plastic rod for reel drum with end plates of plastic card. Wind fuse wire around drum. Cut fixing brackets from thin plastic card and cement to reel and body.

Included in the detail shown on sketch 'C' are some non-standard fittings which were added to certain 'Dorchesters' while in service and the modeller could add these if he wishes his model



Completed 'Dorchester' model made as described in this article and finished as the 2nd Armoured Division vehicle drawn opposite.

HMS 'Discovery'—from page 563

Nova. He successfully led a sledge party comprising Dr Wilson, Captain Oates, Lieutenant Bowers and Seaman Evans. Amundsen, successfully using dogs and suitably dressed for the climate in the manner of the Eskimoes, had already reached the South Pole before Scott's party. On the way back the British party broke down and the remaining three—Scott, Wilson and Bowers—died in their tent of starvation only eleven miles from a food depot.

In 1914-16 Shackleton attempted a Trans-Antarctic Expedition but his ship, the *Endurance*, was crushed in the ice. Shackleton's last Antarctic expedition was made in the *Quest*. During the voyage Sir Ernest Shackleton died and was buried in South Georgia.

On the return of Captain Scott's expedition in 1904 the gallant *Discovery* was put up for sale and she was bought by the Hudson's Bay Company and sailed backwards and forwards across the Atlantic as a storeship. She lay idle in dock from 1912-14 when she was chartered to the French Government from 1915-16 to carry munitions to Russia. In 1916 the Hudson's Bay Company offered the ship to the Admiralty for a relief expedition to rescue Shackleton—but the offer came too late. So the *Discovery* lay idle in dock again from 1920-23. Between 1923-31 the ship was again suitably employed after an extensive refit. This included research work in the whaling grounds round South Georgia, South Orkney and Deception Island, followed by the British-Australian-New Zealand Expedition led by Sir Douglas Mawson to survey Australian Antarctic territory.

In 1931 a new ship *Discovery II* was built, and Scott's *Discovery* was laid-up in honourable retirement in London's East India Dock until 1936. She was then given to the Boy Scouts Association for training Sea Scouts, the handing-over ceremony on October 9, 1937, being attended by six members of the ship's company of her first voyage.

In June 1954 *Discovery* was transferred from the Boy Scouts Association to the Admiralty as a free, unconditional gift. She was formally handed-over on July 20, 1955, and commissioned as HMS *Discovery* for use as an additional drill ship of the London Division of the Royal Naval Volunteer Reserve (since November 1, 1958 the Royal Naval Reserve). In 1960, the forward section was allocated to the Royal Navy and Royal Marines Recruiting Service.

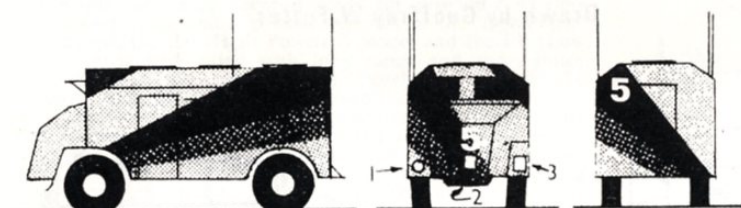
Visitors to the ship may visit the Scott Museum in Scott's cabin off the Wardroom. Personal mementoes of Scott and his shipmates are preserved here in showcases built over his bunk and settee. The Wardroom retains its original appearance and the cabins of the officers and scientists which open into the Wardroom show the names of the original occupants.

THE Publishers of AIRFIX MAGAZINE, which now has an ABC circulation approaching 40,000 copies per month, advise readers to place a regular order with their newsagents, or wherever they obtain their copy, if they have not already done so.

This is because, from the September issue, published on August 28th, AIRFIX MAGAZINE will no longer be available to newsagents' wholesalers on what is known in the trade as 'sale or return terms'.

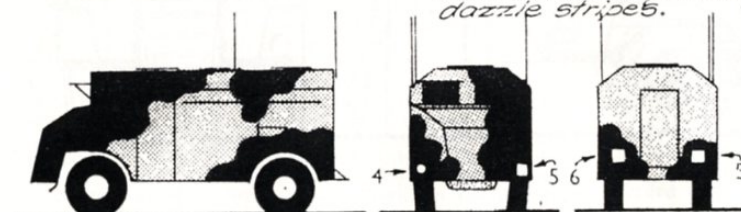
By ordering a regular copy you will be helping your newsagent to assess his requirements accurately and at the same time you will avoid the possibility of disappointment yourself.

WE should like to point out that the material on the Swordfish which featured in the 'In the Air' article in our June 1970 issue was researched and supplied by Lieut-Comdr H. Lipscombe, PRO at RNAS Yeovilton, a fact not made adequately clear in the article.



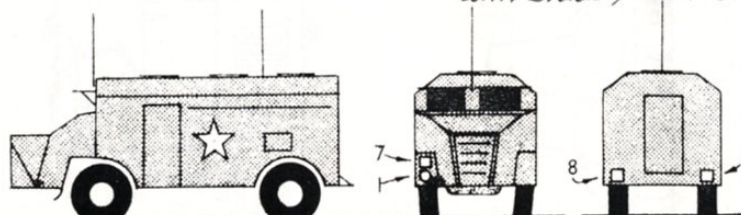
2nd. ARMoured DIVISION

Desert Sand overall with Dark Grey and Blue dazzle stripes.



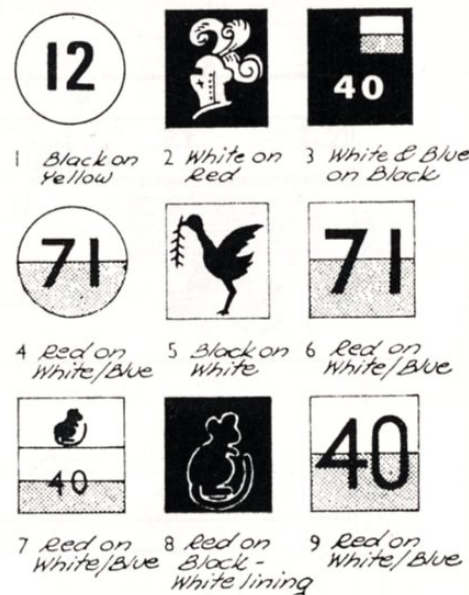
23rd. ARMoured BRIGADE

Desert Sand overall with Black patches.



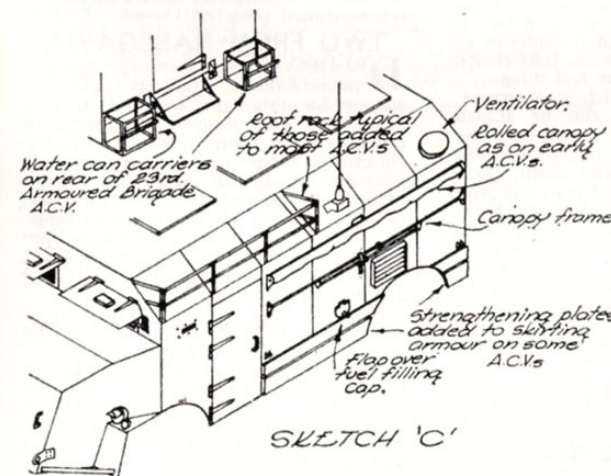
7th. ARMoured DIVISION

'Khaki' overall - white Allied star and ring on bonnet top.



TYPICAL COLOUR SCHEMES & MARKINGS

Numbers are keyed to enlarged views of markings



to be more detailed than the standard production vehicles.

STAGE 4 As 'Dorchesters' served in so many theatres of operations the different colour schemes in which these vehicles were finished were numerous and to assist the modeller in providing an authentic paint finish drawings are given for three such schemes together with formations and arms of service signs. The serial numbers of the 2nd Armoured Division and 23rd Armoured Brigade vehicles were L4426428 (in black) and L4426448 (in white) respectively and these serial numbers were painted on both side surfaces of the radiator armour and on the rear of the body above the door. The serial number of the 7th Armoured Division vehicle is unknown. One particular HP vehicle in overall dark green finish and with all the standard external fittings was serialised L4426509.

NEW KITS AND MODELS

USS 'CONSTITUTION'

REVELL have supplied us with a sample of their new 1:144 scale kit for this historic American frigate, the latest addition to their new series of 'easy-to-assemble' sailing ships which began earlier this year with the *Cutty Sark*.

'Old Ironsides', as USS *Constitution* is nicknamed, is there in almost all her detail. The standard of moulding is very high, the external hull woodwork and copper plating being particularly fine. The simplified shroud/ratline/deadeye pressings make construction quick and easy while at the same time preventing shroud-sag which ruins so many models. An excellent booklet is provided which incorporates clear instructions and detailed drawings, but also includes the one major error in the kit. Diagrams 2, 3 and 4 of the Rigging Instructions (pages 15 and 16 of the booklet) show the various stays passing between the head of a lower mast and the foot of an upper one in each case. For the sake of accuracy each of these stays must be wrapped round the head of the lower mast before being led to its next point. (Incidentally, this is a considerable fault which we have noticed in other Revell instruction sheets.)

Priced at 39s 11d, this is a kit not to be missed by enthusiasts, and even beginners will find it very easy to make a really effective model from it. N.C.L.H.

VINTAGE KITS

THREE old Aurora aircraft kits—the Grumman Wildcat, Chance-Vought Cutlass and Convair B-36 heavy bomber—recently reappeared in some model shops in small numbers. We would not wish these indifferent models on the most inexperienced novice, but the Cutlass and B-36 only increase our longing for 1:72 scale kits of these neglected aircraft. Revell once produced outstanding kits of both machines to 'bastard' scales, but withdrew them a long time ago.

Perhaps Hasegawa/Frog will soon oblige with, in the case of the gigantic B-36, a suitable follow-up to their Boeing B-47. The sheer size of the subject would tax the ingenuity of the most resourceful mould maker, but from memory of the Revell kit, the B-36 can be reproduced nicely to a realistic scale.

Handcrafts of Darlington, Co Durham, supplied a sample of the Aurora B-36. Its scale is uncertain, but as it is only six inches long it may have been intended purely for ornamental purposes. There is no crew compartment as such, and we could pass the blade of a modelling knife through the wing/fuselage joints.

The tail gun is just a stalk of thin plastic, as are the undercarriage legs, and the spartan transfer sheet contains only small 'stars and bars' and minuscule serial numbers. The national insignia, in fact,

are good and could be used on Vietnam machines like the Airfix Skyraider or Bronco.

The crude Wildcat and Cutlass kits call for little comment. An inspection of the contents showed that the former was moulded in a thick, dark blue plastic and the latter marred by heavy rivet detail. These kits are unfortunately legacies of a company which still has much to learn about accuracy in its model aircraft. The Handcraft samples were priced at 4s each. B.R.

LATEST PHANTOM

A GOOD model of a McDonnell-Douglas F-4E Phantom has just been released by Fujimi and is now available in this country. It is a magnificent model in 1:48 scale and naturally has a wealth of detail. Included in the 91 parts are a fully detailed cockpit interior, a workable set of canopies, wing flaps and a wide variety of bombs, long-range tanks and AAMs.

The kit is moulded in both black and white plastic. All of the parts fitted well together and were without the slightest signs of flash. There was no need in some cases to rub down the joint lines as these went so well together. Rivet detail is almost entirely absent but the interior of such things as wheel wells are fully tooled to an exact replica of the real thing.

The kit costs 55s, which is expensive. On the other hand it can be argued that you get value for money and we liked this example from one of the best Japanese manufacturers very much. There are two alternative sets of transfers with the kit, one for an aircraft from Nellis Air Force base and another unidentified. One small point of criticism on the decal sheets was the fact that in the camouflaged aircraft the tail codes were shown in white. As far as we know, most Phantoms, like all other USAF aircraft of this pattern now sporting individual unit markings, have the codes in a light grey.

The kit has been imported by Jones Bros of Chiswick, who have adequate stocks. Postage is extra. A.W.H.

AURORA SHIPS

ALSO in the Aurora range, several interesting ship kits have appeared—or reappeared after an absence. They include four submarines, the *Seaview*—from the TV series *Voyage to the Bottom of the Sea*—USS *Skippack*, a Russian nuclear submarine, and a German 'wolf pack' Type IXC U-boat.

We made up the U-boat and were impressed. The moulding is excellent, almost up to Airfix ship standards, but as the model is not to a constant scale it could hardly be used alongside the Airfix surface ships. Fittings include periscope, two deck guns, machine guns, capstans, jackstaff and bow net cutter. The completed model is 14 inches long,



Latest releases in the Midori 1:40 scale are a German Sd Kfz 222 armoured car, and a post-war French Panhard EBR armoured car. They cost 10s 6d for each kit, which is very reasonable. They feature clockwork drive and assembly is quite straightforward, complete with steering wheels. Both are a little distorted and inaccurate but they capture the character of their respective subjects. Our Sd Kfz 222 sample is shown before painting and without the simulated 'wire' (actually transparent plastic) hinged turret covers which are very effective when in position. Jones Bros of Chiswick can supply, postage extra.

with just the right touch of menace. No precise painting instructions are supplied, but the boxtop artwork gives an idea of the colour scheme. All four kits have a recommended price of 13s 6d. B.R.

TWO FROM HASEGAWA

DRI-DEC, the Letraset type transfer manufacturers who have the UK agency for this type of transfer, now have their own shop in Newbury. In order to cover some of the gaps in the Hasegawa range which Frog are not releasing in Britain under their own brand name immediately, they have imported a number of the Hasegawa range of kits which model enthusiasts are known to want. The two most recent arrivals are the Lockheed T-33 and SOC-3 Seagull.

Both sell for 7s, which is very reasonable considering that they have to be imported direct from Japan.

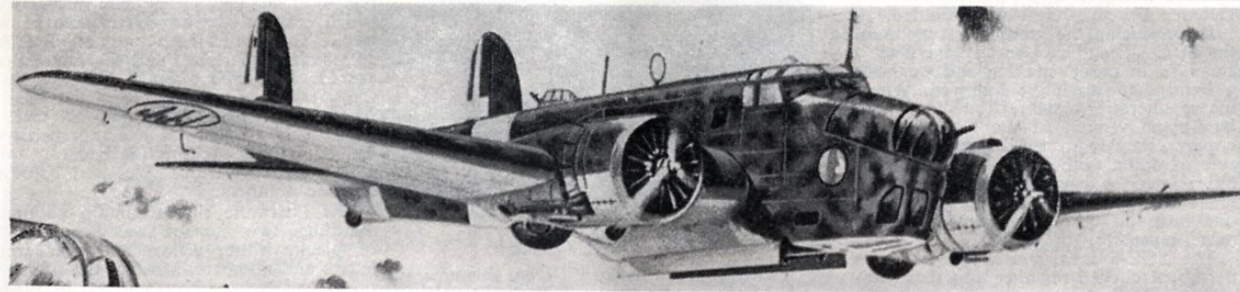
Probably the most interesting kit to contemporary collectors is the Lockheed T-33. As this aircraft has served with almost every air force in the world apart from the RAF, it would seem natural that most modellers, if they are working on a present-day collection, will want this kit. Having 39 parts, the model is easy to assemble. The sections all fit together well with perhaps the exception of the join between the fuselage and the base of the fin and rudder. The model we made up had an obvious gap in this region which needed filling with body putty, but this should present no difficulty to the enthusiast with even the slightest experience and there are many models on the present-day market that are not up to the standard achieved in this kit. A lot of extra weight is needed in the nose to hold the model on its tricycle undercarriage and we found

Continued on page 590

AIRFIX magazine

MODELS

PLASTIC KIT SPECIALISTS—ASSOCIATE MEMBER I.P.M.S.



ITALAEREI FIAT BR 20/20M

This remarkably accurate and very well produced kit of the famous Fiat 'Cicogna' bomber, has alternative parts and decals included so that it may be assembled as either version, BR20 or 20M, both of the Regia Aeronautica. Price: 37/-

1/72
SCALE

All orders for this new kit received from UK resident customers by 31st July 1970, will be sent free of postage and packing charge. Offer applies only to this kit, and we must have the written order by above date.

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 3. Mustangs Mk. I-IV in RAF and Commonwealth service
 4. Merlin engine Spitfires in RAF, Commonwealth and Foreign service
 5. P-51B Mustang in USAF service
 6. P-40 I-IV Kittyhawk in RAF, SAAF, RAAF, RNZAF and RCAF service
 7. P-40-N Warhawk in USAF, French and Foreign service
 8. Griffon engine Spitfires Mk. XII-24 including the Seafire I-47
 9. Spitfire VII and XIII Scouts
 10. P-38 Lightning in USAF, Italian, French and Chinese service
 11. B-24 Liberator in USAF, RAF, IAF and Foreign service
 12. Avro Lancaster in Unit service
 13. Nakajima Ki-43, Hayabusa I-III in JAAF, RTAF, CAF, IPSF service
 14. F4U Corsair in USAAF, USAF, USN, USMC, RAF etc service
 15. B-17B-H Fortress in USAAF, USAF, USN, USMC, RAF etc service
 16. Mitsubishi A6M Zero
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New Kits - continued

difficulty in supporting the nose wheel strut which, due to its scale size, is very fragile. To overcome the problem we reinforced the strut with two small pieces of plastic card mounted in the wheel well so that they did not show after the undercarriage doors were put in place. Transfers for a USAF and Japanese Air Self Defence Force aircraft are included.

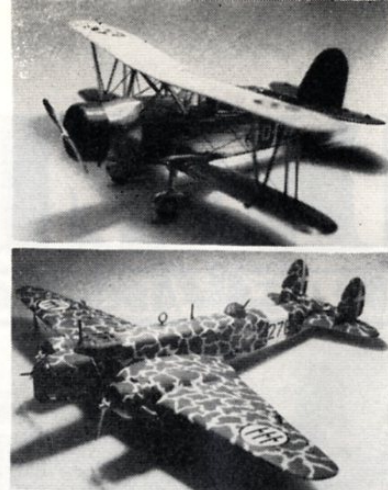
In producing the landplane version of the SOC-3 Seagull, Hasegawa have set a standard in model making and we hope a trend that should be followed. Where major alterations such as a float- and land-plane version of the same aircraft appear, they seem to be following the rule of doing both as separate kits. This move is to be encouraged as it saves a great deal of time and work to convert one into the other and is certainly no more expensive.

The SOC-3 is also a worthy kit. Its parts just clicked together and there was almost no need even to rub down the fuselage joint. Similarly, the wing struts joined the upper and lower wings very satisfactorily without a great deal of careful juggling to get both sets of location holes lined up with the struts. The aircraft is a colourful one and the Profile No 194 gives several interesting schemes that can be applied. In the kit transfers are provided for an aircraft of VO-4 Observation Squadron on the USS *West Virginia*, a pre-war US battleship. The transfer sheet itself is small and we would criticise the US Navy national markings as the centre red dot in these is too small. There are, however, many other markings available on the market to replace these without too much difficulty.

Dri-dec's address is 19 Market Street, Newbury, and we hear that they also have stocks of the latest Mavis, T-37 and Alf kits on the way from Japan. A.W.H.



Hasegawa's excellent T-33, now available in Britain.



Top: The Hasegawa SOC-3 Seagull. Above: Italaerei's Fiat BR 20 finished with the new Italaerei Italian markings.

FROM ITALAEREI

THE first twin motor kit from this new Italian manufacturer has recently been imported by Modeltoys of Portsmouth. This is a superb example of kit manufacture and is of the Italian bomber the Fiat BR 20 Cicogna. This was one of the main types used in the last war and the aircraft that flew on the abortive raids against Great Britain.

Italaerei have thought about this kit very carefully before rushing into mould making. They have brought off several innovations on the way and we commend them for this pioneering work. For example, the whole nose section of the model is moulded in clear plastic so that the windows and turret appear part of the model and not just stuck on. Similarly, they have moulded the wing to fuselage stubs on the fuselage. As this is a slab-sided aircraft, the stubs on the fuselage sides give the model maker the chance to rub down the wing joints until the two parts fit as one. Wheel axles are provided that fit inside the two wheel halves and make the fitting of these items into the oleo legs an easy matter.

Two alternative versions of the aircraft, the BR 20 and the BR 20M, can be made from the kit and the transfers are both well printed and of accurate design.

We can do little less than give this kit a five star rating. The new ideas in mould making alone are worthy of the highest praise, but apart from this the kit is accurate in outline and easy to build. Italaerei have entered the kit manufac-

turing world with a bang. Price of the BR 20 is 37s and it can be obtained from Modeltoys, 246 Kingston Road, Portsmouth. A.W.H.

NEW TRANSFERS

A PART from their work in manufacturing complete kits, Italaerei have also entered the highly competitive transfer market. This month sees the release of five new sheets from this source which retail at the attractive price of 5s each. Three of these are of Reggia Aeronautica markings and the remainder are for Luftwaffe aircraft. Of each set, the Italian examples are the best. Although no really large national markings are given there is a comprehensive collection of squadriglia badges, tail markings and various sizes and colours of code numbers.

The Luftwaffe sheets contain national markings, two sizes of swastika and sets of black, white, yellow and black/red letters and numbers. Most of the subjects on this sheet have been covered by other manufacturers but not all in the same price range. In short, excellent value for the money and available through Modeltoys, Kingston Road, Portsmouth.

Dri-dec have two new sheets on the market this month. M35 covers US national insignia for Navy aircraft and contains last war stars and bars in white for use with aircraft painted in sea blue gloss. There are also a number of figures and several sizes of 'Marines' markings. Sheet M36 presented a poser when we first saw it. The manufacturers have produced a series of Luftwaffe night fighter markings with the national insignia in grey. A study of available reference revealed that this was possible though we thought that generally speaking most night fighters of this era had the white only Balkenkreuz. Setting aside the possible arguments in connection with this subject the sheet is an excellent one and contains national insignia, unit markings for a Bf 110 G-4 of 9/NJG 4, and code letters for numerous other units. These, however, are only given in part and the model maker will need Sheets M20, M29 and M38 to complete the markings when all of these become available. These sheets, which retail for 7s each, will have an undoubted attraction to Luftwaffe enthusiasts and modelers. Dri-dec markings can be obtained from 19 Market Street, Newbury, Berks, or leading model shops. A.W.H.

Bombing Colours - from page 581

L2682, L2688. Later coded ZL.

No 148 Squadron based at Scampton, to Stradishall March, 1938, equipped June-September, 1937. Examples used: K7720, '21, '25-'28, '32-'35. Carried '148' aft in yellow. Later coded BS. Re-equipped November, 1938.

No 207 Squadron based at Worthy Down equipped August-September, 1937. Examples used included K7756-66. Carried squadron number in flight colour with white identity letter aft. Re-equipped April, 1938. It will be noted that the Wellesleys did not have the usual grey lettering but had individual markings, until code letters were introduced.

Three overseas squadrons were equipped with them before the war, they were:

No 14 Squadron based at Amman equipped June-August, 1938. Examples used: K7755, '59, L2649, L2692-2700, L2650-2659, L2697. They had the squadron motif on the fin and an individual letter aft in white eg, L2766:W.

No 45 Squadron based at Helwan, moved to Ismailia January, 1939, and equipped at the end of 1937. Examples used: K7776-83, K7756, '57, '60, K7784-86. Carried '45' in grey ahead of roundel with individual letter aft in grey as on K7742:45-T. Re-equipped June, 1939.

No 223 Squadron based at Nairobi equipped May, 1938. Examples used: L2701-2709, L2660-70.

Aircraft of these squadrons carried pre-September 1938 style markings to the outbreak of war.

Michael J. F. Bowyer

AIRFIX magazine



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By James Rarey and Icks. WE Inc. Also just arrived—It is a facsimile reprint of the 1934 edition covering Tanks and Armoured Vehicles from 1916-1934. Covers experimental tanks and a complete resumé of tank operations 350 pages, over 150 illustrations 80/-

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coverage of value to both beginners and experts. Quality of the pictures and reproduction could hardly be bettered and there are extensive bibliographies and indices. These books are a pleasure to read and handle and anyone with even a passing interest in old weapons could well become a confirmed enthusiast after reading these—as well as having a good deal of excellent and informative material for a relatively low outlay when the exceptionally high quality of production is taken into account.

Famous Fliers

THE STINSONS, by John W. Underwood. Published by Heritage Press. Available in Britain from W. E. Hersant Ltd, 228 Archway Road, London N6. Price 54s, post paid.

THE Stinsons can be described as the 'All-American Flying family' as from the very early beginnings of aviation in the States their name has been associated with training, demonstration work and more recently light aircraft manufacture.

The Stinson built Detroit appeared in 1926 and was followed by a large number of high-winged radial engined aircraft, one of which the SM-1 broke the world endurance record in 1930. In the 30's the Stinson developed a tri-motor design which became well known on the internal US air routes before the advent of the DC-3. The Stinson Reliant—perhaps the best known of their many designs—came in the mid-30s and was the beginning of mass production for the company. Since then Stinson aircraft have served with both the USAF and US Navy in large numbers. The Vigilant and Sentinel did world wide service during the war as observation aircraft. The Stinson name was taken over by Pipers in 1948 and although the then current model, the Voyager, was left in production this was completed a year later and Stinsons became part of history.

The story of the Stinson family is not well known in this country and therefore the production of this book is a great contribution to aviation historical literature. The book is well illustrated and has a graphic account of how one of America's little known aviation companies developed.

Basic Book

A SOURCE BOOK OF AIRCRAFT, by Maurice Allward. Published by Ward Lock Ltd, price 14s.

THIS pocket sized book, part of a series on locomotives, cars, and ships, is designed for the younger reader. It contains photographs and details of more than 150 aircraft types that have had an influence on the development of aviation since flying became a practical proposition. Each picture has notes on the history and details of the aircraft's dimensions and performance.

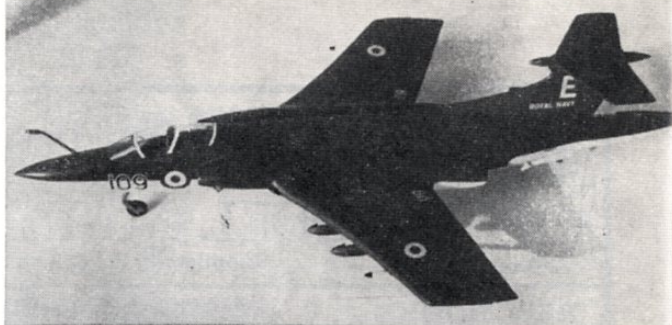
Japanese Aircraft

JAPANESE AIRCRAFT OF THE PACIFIC WAR, by R. J. Francillon. Published by Putnam & Co Ltd. Price 105s.

THE armed might of Japan was sadly underestimated by both the British and American forces in the Pacific during and before the early stages of World War 2. The result of this lack of military intelligence is now history but it almost led to the United States influence being removed entirely from the area.

All these facts are amply recorded in this superb book by Rene Francillon. He is an undoubted authority on Japanese Navy and Army aviation and the book gives details of all aircraft used by both services before and during the war. Even now, some 25 years after the end of the Pacific conflict, there is no great detail known about Japanese aviation, few pictures are available and although several authors have attempted to nibble at the edges of this vast subject this is the first authoritative work published in such comprehensive detail. The first section of the book is devoted to a brief history of the Japanese aircraft industry followed by histories of the air arms of both the Navy and Army. The complicated mysteries of the Japanese aircraft designation system are also dealt with—a problem which led the allied commanders in the war to give code names to all enemy aircraft as the only sure way of recognising their identity.

One particularly interesting section deals with the fundamental camouflage and markings used by Japan during the war.



Ronald Chesnau sent us this view of a Buccaneer S1 conversion based on Alan Hall's article (December 1968 issue) but simplified for the benefit of those put off by the complexity of the work involved. It follows the original drawings, but the modified parts are from scrap items. The jet orifices come from the drop tanks of the old Hawk Banshee kit, although any suitable old 1:48 scale tanks would do. Suitably doctored bombs provide the tail-plane fairings, and the VHF aerials come from modified Sparrow missiles. The white-outlined fuselage numerals were taken from Dri-dec sheet M1, which fortunately provides the exact size required.

Possibly recognising the growing interest in this subject the book has started what it is hoped will be a precedent for future Putnam publications in providing this information. Side view drawings and an accurate colour guide linked to the International Plastic Modelling Society colour code numbers are given. Appendices include a number of lesser known Army and Navy types and there is a section on foreign aircraft either built under licence or directly copied by the Japanese industry. Japanese aero engines and aircraft armament is also dealt with.

Aircraft album

HISTORICAL AVIATION ALBUM, VOL. 7, by Paul R. Matt. Published by Historical Aviation Album. Available from W. E. Hersant Ltd, 228 Archway Road, London N6. Price 31s 6d post paid.

ANOTHER in the series of short monographs on interesting aircraft both historical and contemporary in the American sphere of aviation. In this issue the most interesting work is on the USAF's B-70 supersonic bomber but there are other useful descriptions of the Curtiss P-36 Hawk series of fighters, the Boeing 307 Stratoliner and early Curtiss aircraft. Three view drawings suitable for model makers are included with each section.

In brief . . .

DONALD FEATHERSTONE, well known for his wargames books, has compiled a handy volume for model soldier fans which is published by Kaye & Ward at 30s. under the title *Model Soldier Collector's Handbook*. It is packed with the sort of information specially useful to a beginner to the hobby; model soldier ranges, stockists, societies, magazines, and much else is gathered together. The book is well presented, though we noted one or two out-dated entries (the address of *Airfix Magazine* being one of them!), but these are difficult to avoid in reference books of this nature since prices, addresses, and so on are constantly altering. Ian Allan Ltd. have now published John W. R. Taylor's *Light Plane Recognition*, as forecast in a previous issue. In the usual style, there are silhouettes, specifications, pictures, and histories of virtually all small civil aircraft flying in Britain and not covered in the companion book *Civil Airliner Recognition*. It's a snip for a modest 5s. From Profile Publications come several new titles. In the Aircraft series the Mitsubishi G4M Betty, the Swordfish, and the Junkers 87G are the latest releases, the Swordfish having two extra pages of colour. This one is, perhaps, the best of the bunch, if only because little has been published on this famous aircraft before. In the AFV series we have The Ram, Universal Carrier, and Medium Tanks Mk I-III as the latest three. The Ram actually covers all Canadian-produced tanks of World War 2 as well as the Ram itself, and the contents will be new to many. The Medium Tank Profile sorts out the many marks and sub-variants and includes good pictures but disappointing colour views. All these Profiles cost 5s. each from virtually any big hobby shop or specialist bookshop. Latest: from Kookaburra is *Combat Aircraft of the Battle of Britain*, priced at 8s. 6d., postage extra, from either BMW Models or Motor Books, 33 St. Martin's Court, London, WC2. It offers little that is new on the subject, however, save for some nice scale drawings. The colour pictures are from the film or show preserved aircraft. The summary of the battle and the pictures might be handy for younger enthusiasts, but there seems little in this book that cannot be found elsewhere.

AIRFIX magazine

Letters to the Editor

My Bolingbroke

WELL you've done it again. On page 141 of the November 1969 issue of the *Airfix Magazine* you publish a photo of a Bolingbroke No 9948.

On looking through my log book I find that on Sept 15, 1943, I first flew this machine for one hour. During the next two months I flew this machine on numerous occasions. On Oct 31, 1943, I last flew No 9948. This was the last aircraft I flew whilst in Canada. No 9948 was then from No 1 Bomber and Gunnery School, Jarow, Ontario.

Each month I go through your excellent magazine looking for aircraft I have had something to do with. Keep up the good work. I have just about all the 1:72 scale kits Airfix have manufactured.

T. B. Pearce, Takaperna, NZ.

Moulding technique

SEVERAL letters have recently been published in *Airfix Magazine* on the subject of reproducing parts such as engine cowlings from plaster of paris moulds. Instead of this rather breakable material I use a silicone rubber compound which reproduces the most minute detail and bends easily to release castings.

It is Silcoset 100 made by ICI and is obtainable at a hardware or paint shop. The equivalent American material is Dow Corning Silastic 588 RTV. It is supplied as a fluid with a catalyst and after mixing can be carefully poured over the part to be moulded and left to set overnight.

The rubber releases readily from nearly any sort of material so all kinds of casting material can be used to reproduce the part. As it withstands temperatures up to 500°F, printers' type metal can be used to cast model soldiers etc. Personally I use the fibreglass resins used for car-body repairs. A part cast in this material can readily be cut and filed and takes paint well.

Using rubber moulds and fibreglass I have been able to run-off Halifax cowlings for any number of Lancaster II conversions!

John G. Tuckey, Rotorua, NZ.

Lunar module

REGARDING Mr. Baker's letter in the June Issue, I would agree with him partly about the colour scheme of the Apollo II Saturn V. According to the coloured photographs published by *Life* magazine, however, there is no trace of the red colour Mr. Baker mentions on the 2nd/3rd Interstage ullage motors and he missed the fact that the Launch Escape System Rocket is white, not silver as shown in the kit.

Also, the Apollo II Service Module was most definitely silver except for the cooling radiators on the lower or rear end of the Module. These, by the way, should only extend forward about 1/3 of the length of the module but may be filed down with a nail-file. There should also be eight smaller radiators around the forward end of the module. These may be added from thin plastic card or even note paper.

Letters to the Editor selected for publication entitle the senders to each receive a free Airfix plastic construction kit of their choice. We are always pleased to receive your comments and pictures, which will be considered for publication. Submitted material and pictures can only be returned if accompanied by a stamped addressed envelope, and the Editor cannot accept responsibility for safe keeping of any such contributions, neither does he necessarily agree with comments expressed by correspondents in the letters column. Please note that any letters anticipating a reply MUST be accompanied by a SAE or stamp.

Also missing from the kit is the fairing covering the connections between the Command and Service Modules. This should be added on the side opposite the hatch and not alongside or below it as is shown on most models. This was only the case on the Command Modules preceding the tragic fire which necessitated the complete redesigning of the wiring and hatch systems.

However, judging from the accuracy of Airfix's Lunar Module, (which should be painted gold around the lower stage, or, better still, have gold cigarette paper stuck around it, and the reaction control rocket flame guards transferred to the descent stage). I am sure that when their Command/Service Module kit is released, it will be another pointer to more expensive model manufacturers to look to their laurels.

B. G. Armstrong, London, SW2.

Red Baron

ARTIST R. Williams should really have done a little more research in depicting the Fokker Dr I (May cover) in which Manfred von Richthofen was brought down.

I will not bring up the controversy as to whether this particular triplane was actually red all over as it is doubtful if this will ever really be resolved. However, the crosses should be of the straight-sided Balkenkreuz type with white outline all round. This is confirmed by at least one piece of fabric from the von Richthofen aircraft, with cross painted on, which is still in existence in the Canadian War Museum. There is also little excuse for showing asymmetrical ailerons, a peculiarity only of the well-known Stapenhurst triplane which was evaluated by the Technical Section of the RFC, this machine having been fitted with an odd aileron 'in the field'.

In view of Paul Leaman's excellent and very comprehensive series on the Fokker triplane last year I am surprised these faults should have been made.

Peter L. Gray, Luton, Beds.

Deck planking

I WOULD like to compliment Airfix on their excellent series of Historical Sailing Ships, which I consider are the best value for money currently available. Whilst constructing these ships I had a lot of difficulty in getting a realistic effect for the deck planking. After much experimenting (which included in desperation separate

painting of individual planks). I devised a technique which may be of interest to fellow enthusiasts.

The basis of the method is to cover the decks in 1/32 inch balsa sheeting. To achieve this I traced the deck shapes and locating holes onto the balsa, then using a craft knife and steel ruler cut the planking detail on to the decks using the kit for reference. Fine tissue paper was then cemented to the back of the balsa enabling the decks to be cut out in one piece. The surface detail was sanded off the plastic decks and the hull was assembled, after which the balsa decks were cemented in place and the locating holes drilled out. The balsa helps to cover the unsightly joints which inevitably occur at the sides of the deck.

I have not varnished my decks as I think this detracts from the realistic 'scrubbed wood' finish, but well diluted poster paints may be used to emphasise certain planking details.

I realised that this method sounds rather involved, but in practice the entire procedure takes under an hour which is less than it would take to paint, and I can assure you that the effect obtained is the ultimate in realism.

R. J. Stammers, Middlesbrough, Yorks.

Spitfire preserved

WE at Leuchars are rebuilding and refurbishing Spitfire 16 TB252 in the markings of 340 Isle de France Sqn, as GW-H, with which it carried out 40 operational sorties (Americans flew missions) and hope to at least be able to taxi it.

Can any readers help us by allowing us to borrow any available photos of any aircraft of 340 Sqn between 1944-45 and can any reader confirm whether it was in British or French markings?

It might be of interest to know that when we stripped the aircraft we found five swastikas on the port upper cowing and 'Lucky Nine' painted on the cockpit escape door.

F/Sgt A. More, 'C' Flight, 202 Sqn, RAF Leuchars, Fife, Scotland.

Scout uniform

REGARDING Mr Turner's letter on the Scout conversion in the June issue, I would like to point out that there are a few alterations in the new Scout uniform that he didn't mention. Firstly, the shoulder straps on the shirt have now been omitted, to the disappointment of many Scouts who now don't know what to do with their berets when they go to Church after a parade. Also, the belt is now narrower than before and about 1 mm should be removed from the belt on the model. The buckle is also smaller. Incidentally, there is no such thing as 'the modern Boy Scout'; their name is now simply Scouts.

Allan Dickinson, Abergavenny, Mon.

Voodoo colours

IN the June issue Michael J. F. Bowyer states in his 'Colours 1960' that the first production F-101C, 54-1486, had a black

Continued on next page

Letters—continued

radome, but it also had a black band around the fuselage just short of the trailing edge of the wing. By 1961 this Voodoo had a blue fin and rudder covered with white stars. The stars themselves were of two different sizes. No 78 Sqn was known as the Bushmasters and was based at Woodbridge. The other two squadrons in the 81 TFW were the 91 (Bluestreak) and 92 (Avenger), both based at Bentwaters. For bombing practice detachments of all three squadrons flew to Wheelus Air Base in Libya.

D. Hatcher, Gosport, Hants.

'Leander' details

I HAVE just completed the Airfix model of the 'Leander' Class GP Frigate. It is up to the usual high Airfix standard and I like the new-style 4.5 inch turret. However there are a few minor details worth correcting. Only the *Arethusa* can be made, strictly speaking, as neither *Leander* or *Dido* are as yet armed with the Seacat missile system. Also the guns on either side of the bridge are 20 mm and not 40 mm. The colour of the decking is not brick red but dark green with a grey-green flight deck.

D. Moore, Horsham, Sussex.

Simple conversion

I HAVE just finished collecting all the Airfix historical figures and my favourite is the Yeoman-of-the-Guard. I converted my model to Chief Yeoman Warder. For this there are slight colour changes. The piping is the same but the rosettes are different. The centre is red with four blue oblongs from it. At the end of these are red oblongs and beside and above the red there are white oblongs. The crowns change as well. The framing is gold, the centre is crimson and has pearls studded round it. The jewels are red, green and purple, along the bottom. The leaves on the emblem are gold with black details. The primrose is gold with a white centre and five green leaves around the edge and five green spots around the white centre. The shamrock is white with black detail around the edge and four pink spots on each leaf. The thistle is gold with ten green spots around the centre white flower with one pink vertical line across, edged with black. On the right arm are four gold braids with a small crown above that, and a crown and two crossed swords in the centre of the braids. The pole is black and not brown.

Clive Daniels, Rickmansworth, Herts.

Jetstream details

HAVING just bought the excellent Airfix Jetstream which followed the sad and catastrophic demise of Handley Page Aircraft, I realized that the aircraft depicted in the kit would probably never materialize. There is only one Jetstream 3M flying, the prototype G-AWBR (c/n 258) and using the transfers from the kit this plane can be depicted. The scheme is as per instruction sheet (white, silver, dark blue cheat line) and the markings are applied except for the national insignia (stars and bars, USAF) and the C-10A instruction panel and registration. The registration G-AWBR appears in 1/4 inch black square cut letters above the cheat line aft of the freight door. A similar registration appears on the wings where the USAF would have occurred. Another scheme for G-AWBR would be light grey overall with lettering in the same places as



Above: Latest from the Rareplanes' people is this 1:72 scale Russian I-15 biplane, which as a set of mouldings (less wheels and propeller, etc) costs 10s 6d plus 1s postage. Improved surface detail, almost as good as on a normal polystyrene kit, is a feature of the model. It's not for beginners, however. It can be had from Rareplanes, 18 Hillford Place, Earlswood, Surrey.

above. This scheme is the scheme in which it first flew.

I hope this scheme will be of help to those modellers who like to keep their models of representative aircraft and not hypothetical schemes.

Kenneth Ellis, Liverpool.

Wheel wells

WITH the re-issue of many older Frog kits many modellers are meeting the problem: How to open the wheel wells? You suggested to use a drill. I found that a needle, heated over a candle flame, did the job much easier and quicker.

In the excellent series of articles about the German panzer uniforms I read that you can use Banara Oil to fix Plasticine. Humbrol gloss varnish is a good substitute for it, and, at least for me, easily obtainable.

To close my letter would it be possible to publish the official colour scheme for the Hawker Harrier and to tell me how to mix the light stone colour for the Hercules?

Andre Jungbluth, Antwerp, Belgium.

A Harrier feature is planned for later on.—EDITOR.

Cessna details

THERE are several small modifications that may be made to the Airfix Cessna 0-2 which will improve the accuracy of this excellent little kit.

(a) A small blister identical to that on the starboard wingtip is made from scrap sprue and cemented between the rear intake and the location for part 61, and a small hole made in the tops of both blisters. Two whip aerials, each 0.8 inch long, are made from heat-stretched sprue and mounted in these holes, curving backwards.

(b) A larger blister (1/16 in. across) is cemented centrally below the fuselage, 0.5 inch behind the nosewheel bay.

I found a photo of the aircraft featured in the kit (USAF 21295) in the 1968 *Observer's Book of Aircraft*, which provides an alternative colour scheme.

The aircraft is painted as per instructions, except for the upper surface of the wing, which is grey apart from a white stripe (approx 18 inches wide) which runs from tip to tip, passing immediately behind the roof transparency. The whip

Below: Roumanian reader Mihail Moisesu, of Bucarest, made these delightful and exquisite models of the Whirlwind and Dragon Rapide entirely from scrap wood, wire, and other oddments. They are fully detailed, with cockpit interiors and cabin fittings in the case of the Rapide. All the markings are painted by hand. Models are to 1:100 scale and the cigarette packet gives an idea of their size.



aerials, and parts 61, 62 are black. No propeller warnings are carried.

Howard G. Mason, Ascot, Berks.

Scale up

MANY collectors specialize in the scale of 1:32 for armoured and soft-skin vehicles. One of the frustrations of being a 'one scale' modeller is the wide variety of scales from which you have to select your material and 'scale up'. Here is a handy reference guide for 'scaling up' vehicle drawings to 1:32.

Example: If plans for a vehicle are to the scale of 1:100, you would multiply by 3.125 to get the 1:32 scale.

For other scales, the multipliers are as follows:

1:90 multiply by 2.82 to get 1:32
1:87 multiply by 2.72 to get 1:32
1:76 multiply by 2.38 to get 1:32
1:72 multiply by 2.25 to get 1:32
1:48 multiply by 1.5 to get 1:32
1:43 multiply by 1.34 to get 1:32

For hobbyists with a pile of money, commercial photo-copying houses will enlarge plans to the correct scale photographically. This is an expensive process, however.

H. R. W. Morison, Scarborough, Canada.

Useful tip

IF the metal wire is unwound from an old bass string of a Spanish guitar one is left with a core of very fine strands of nylon. I have found this very useful for the tail and mane for a Historex horse when several thicknesses of it are put together and 'combed out' using a needle.

The wire that is left is also very fine and can be used to effect as coils of wire etc for AFVs and military scenes.

Adrian Swenson, Manchester.

Pembroke recalled

I thought you might be interested to know that the first Pembroke C1 ferried to the Middle East was in 1954 by No 167 (Long Range Ferry) Squadron when Squadron Leader H. D. Byrne was Commanding Officer after me at RAF Benson.

I imagine WV706, which you illustrated in your 'In the Air' section (May) must have been ferried by my old Squadron, as I have an entry in my Log Book: '9th April '54 PEMBROKE C1 WV704 45 minutes conversion for New CO'.

Our first Pembroke ever at Benson was WV701 on March 30, 1954, when I was converted on type by Sgt Allen of the Basic Ferry Training Unit.

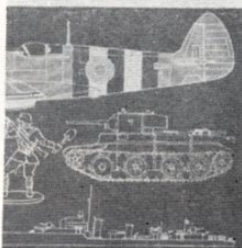
No 167 Squadron was responsible up to 1959 for all ferrying to Middle East, Germany, Far East and we once had a commitment of 36 Mosquitoes for the Yugoslavian Air Force—great fun.

I find it hard to believe it is over 16 years since flying a Pembroke and they are still going, but will never come up to the dear old Anson.

Wing Cdr David Bennet, Southampton.

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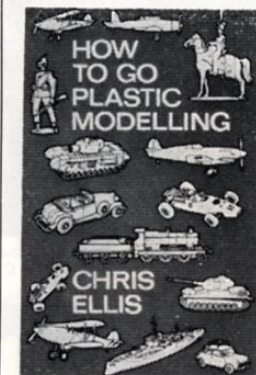


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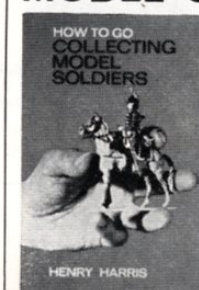


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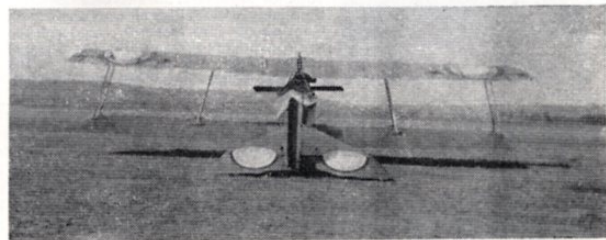
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More rare pictures from readers with captions by Michael J. F. Bowyer. A free Airfix kit is awarded for every picture published, but please note that there is usually a delay of some months before publication due to the limited space at our disposal.

Key: (2) RE 8 F175? of 47 Sqn at Novorossisk in the winter of 1919. Note bomb sight on side of fuselage (Paul Beaver).



Key: (1) Setting the scene for this month's pictures of the RAF in Southern Russia, 1918-20, is this DH 9 of 47 Sqn, C6219, thought to be at Batum (D. Collinge).



Key: (3) Nieuport used by an Imperial Russian bomber squadron at Beketofka in 1919, in action against Bolshevik forces. It has standard RAF camouflage of the time but Imperial Russian roundels. (4) Crashed DH 9 of 47 Sqn on June 22, 1919, in the Kharkov area of Southern Russia. It is C6337. The man in the picture is holding the joystick and two 20 lb Cooper bombs are stood on the extreme right (Paul Beaver).



Key: (5) A Snipe(DC) trainer (DC: dual control) of No 1 Flying Training School at Netheravon in 1923 (J. G. Wood). (6) Fairey Fawn J7205 of No 11 Sqn at Netheravon in 1924, in silver overall finish (J. G. Wood). (7) Two Avro 504s of 'M' Flight, No 1 FTS, at Netheravon in 1920, in flight over Salisbury Plain. Note machine gun on one aircraft (J. G. Wood). (8) A close view of the pilot and observer of a DH 9 of 47 Sqn in Russia showing the Scarff ring, Lewis gun, and pilot's gun sight (D. Collinge). By coincidence Mr Collinge, whose uncle is shown in the picture, sent us a second view (from the other side) of the DH 9 shown in picture 4 which was taken by Mr Beaver's uncle! Bruce Robertson tells us that Mr Beaver's uncle won the Meritorious Service Medal for his activities with 47 Sqn.

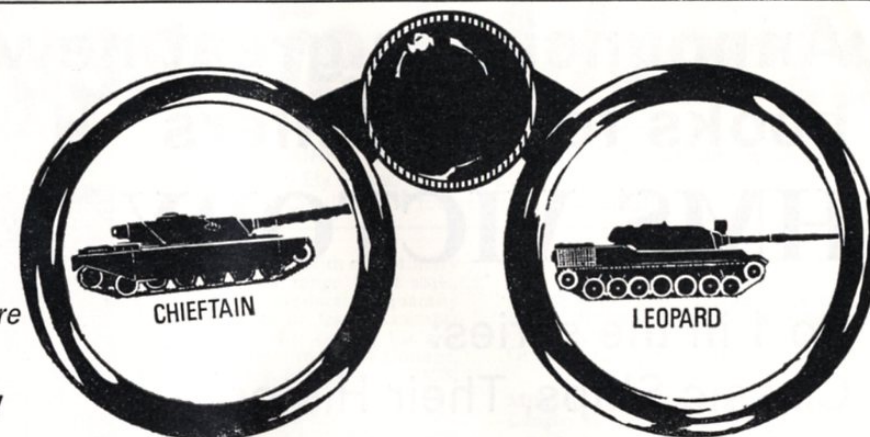


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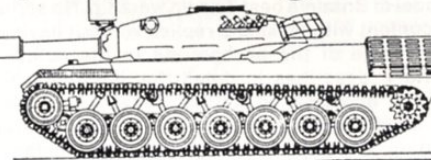
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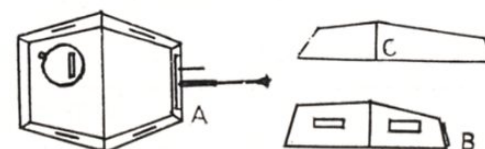
Sd Kfz 231 and 234/3

USING the instructions given for armoured car conversions in the last two issues of the magazine, it is now possible to construct more interesting variants.

First of these, the Sd Kfz 231, was the earliest of the eight-wheelers and dated from 1939-40. The hull modifications given in the last issue (involving deck, hatches and mudguards, etc) apply to this model, while the roof and sides are made as described for the Puma in the June issue. Make up a turret from styrene sheet as in drawings A and B, using pins for both the machine gun and 2 cm KwK 38 which forms the main armament. All the turret faces are flat, which simplifies the work.

Another variant which appeared in smaller numbers at this time for the close-support role was the Sd Kfz 234/3, mounting

Below: Full-size drawings as described in text. Right: Sd Kfz 231 (top) in grey 1940 finish, and two views of the Sd Kfz 234/3 in sand/green 1944 finish.



the same 7.5 cm L/24 gun as had earlier been fitted to the Sd Kfz 233, illustrated last month. Major difference was that the weapon, in the case of the 234/3, was mounted centrally immediately behind the driving position, so that in the model you can use the unaltered cradle supplied in the kit, just sited further forward. Apart from making up the L/24 gun from scrap, you will also require the part in drawing C to replace the original side coamings. This is continued across the front of the vehicle, on each side of the gun. This is the least complicated of all the conversions. The engine and rear hull remain unaltered and the mudguards are from styrene sheet as described and drawn in the June issue.



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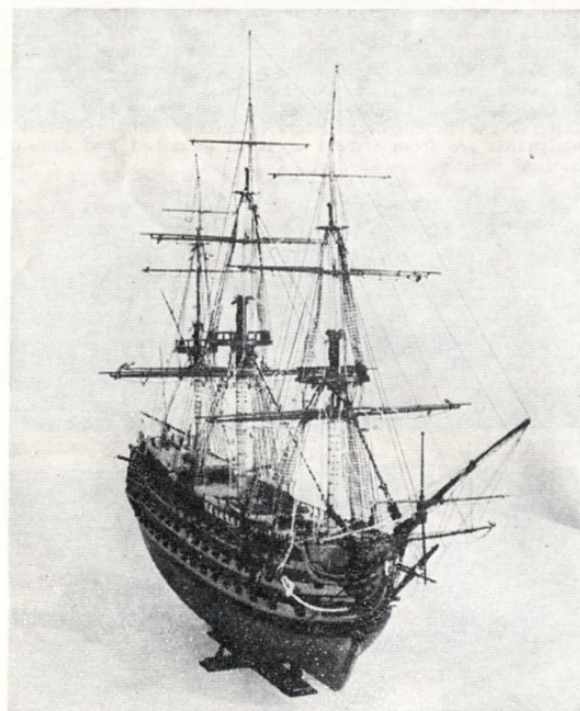
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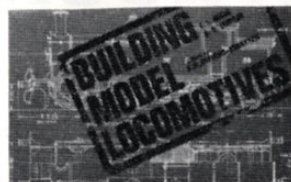
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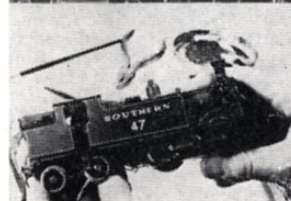
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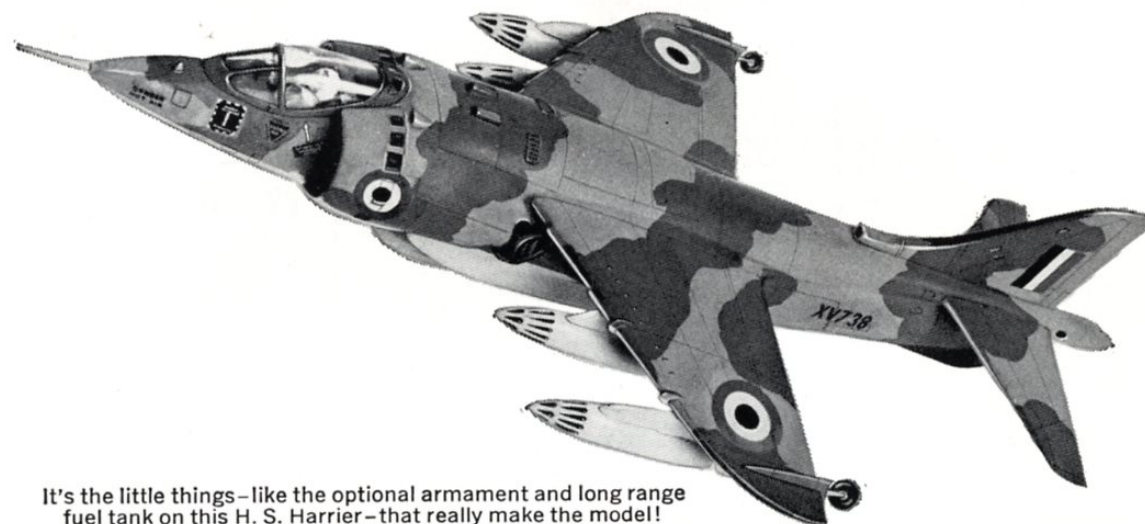
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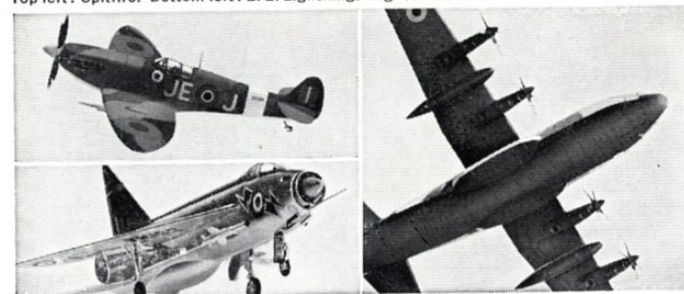
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